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THE

CHOLERA SPASMODICA,

AS OBSERVED

IN PARIS IN 1832:

COMPRISING

ITS SYMPTOMS, PATHOLOGY, AND TREATMENT.

ILLUSTRATED BY CASES.

BY ASHBEL SMITH, M. D.
OF NORTH CAROLINA,
Officially attached to the Necker Hospital, during the prevalence of this Epidemic.

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Je soussigné, médecin de l'hôpital Necker (de Paris) et membre de l'Academie Royale de Médecine de la même ville, certifie que M. Smith (Ashbel) docteur en Médecine a été attaché pendant tout le temps de l'épidemie de Paris, au service des cholériques de l'hôpital, et qu'il a soigné les malades avec un courage et un zèle dignes des plus grands éloges, qui lui ont mérité d'ailleurs une indemnité de la part de l'administration des hôpitaux, et l'estime de ses confrères médecins et chirurgiens de l'hôpital.

BRICHETEAU, D. M. P.

Paris, 1832, *Hopital de Me Necker.*

GEORGE P. SCOTT AND CO.
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TO

MY FATHER.

ASHBEL SMITH.

PREFACE.

WHAT I have written on the cholera was commenced in the form of a letter to a medical friend. As I proceeded, my observations spread over a much greater space than I had anticipated, and I resolved to publish them. To avoid as much as possible any unnecessary increase of bulk, I determined to confine myself to the relation of what I have *seen*. To this determination I have strictly adhered, except in one or two instances, where I expressly quote the authority of others. It is to this that my pamphlet owes its merit, if it have any. I have related *facts* which I have seen, and for the truth of which I therefore pledge myself. *I have described no symptom, no post mortem appearance, no treatment, which I have not myself witnessed.* The little speculation, in which I have once or twice indulged, I shall never take the trouble to defend against the attack of any person.

That it may appear that I have had abundant opportunities for studying the cholera, I think it proper to mention, that during the prevalence of this epidemic, I was officially attached to Necker Hospital, where I remained the greater part of each day; that I not only heard the medical prescriptions, but was charged with much provisional and active service in their administration; that I watched their effects, and recorded them at the bedside of the patient.

Notwithstanding the redundancies and repetitions contained in what I have written, I should have found it much easier to write a book on the subject than to compress my materials into a pamphlet. To keep this within a proper size, I have omitted some things, and briefly touched on others where I wished to be much more full. Some slight omissions are a consequence of the despatch I was obliged to use in arranging my facts.

I had also intended to publish many more cases, but I considered it would swell this publication to an inconvenient bulk to add a sufficient number to enable the reader to draw conclusions from them. For this purpose, less than fifty or a hundred would be of little use; I have therefore concluded to give a few cases as *specimens*, and to occupy my pages with a digest of the symptoms and treatment, made from the whole number in my possession.

My observations on the cholera were written in Paris, and in part sent to America, when I heard of the appearance of this disease in Canada. This accounts for my having spoken in several places of the appearance of this disease in our country, as problematical. My intention, as I have before stated, was simply to embody those facts of which I had been a witness. On my arrival in New-York I found my pamphlet in the course of publication. I concluded to publish it as it was written—an account of the cholera as it appeared in Paris, and of the means employed to combat it, by the celebrated practitioners of that city. Though my observations have been chiefly made in a single hospital, yet from the frequent intercourse of medical gentlemen, and the publicity given to the different methods of treatment, by means of the Royal Academy of Medicine, and the various publications on this disease, I have been enabled to see put in practice the remedies suggested by the combined skill and experience of the Parisian faculty.

We are assured by those who have observed the cholera in different countries, (and I had occasion to remark the fact on seeing it in London,) that though presenting in all places nearly the same leading characteristics, this disease exhibits in different regions, a considerable variety in the

rapidity of its march, and the severity of its symptoms. The same epidemic is also much modified at different periods, most noticeably on any great increase in the number of new cases. For this reason I have dwelt on several of the minor symptoms with a minuteness that some may think excessive.

In noticing the remedies unsuccessfully employed, I have not mentioned all that charlatanism has vaunted, because they have notoriously failed in the hands of their patrons, and were clearly undeserving a trial.

I have said nothing of atmospheric vicissitudes, as I was unable to perceive that the epidemic was thereby affected.

The distinction made in Europe of cholera, into a severe form and a mild one under the name of cholerine, I have retained. It is important to bear this in mind in considering comparatively the statistical results of different methods of treatment; otherwise we commit great errors, for a cholerine is very seldom fatal, if attended to.

If it be found that I have faithfully executed the task which I have imposed on myself, I shall be satisfied, though I do not profess to point out any method of treating cholera which shall in *all* cases prove successful.

ASHBEL SMITH.

THE

CHOLERA SPASMODICA,

AS IT APPEARED IN PARIS IN 1832.

There were rumors, from time to time, which since appear to have been well founded, of sporadic cases of cholera occurring in this city, previously to the 26th of March last, when the disease appeared epidemically. So rapid was its increase, that on the 9th of April, at 12 o'clock, 1020 new cases were officially reported for the preceding twenty-four hours. On the same day, according to the official bulletin, there were 861 deaths from the cholera. It is the opinion of very many persons, that the number of new cases and deaths was considerably greater than that officially given, either from the great fatigues and unintermitted employment of the physicians rendering it impossible for them to return complete reports, or from design on the part of the administration, in order to allay the apprehensions of the people. However this may be, the disease at this time was arrived at its maximum of intensity, which it maintained with slight variations till the 14th, that is, about five days. The period of decline then commenced decidedly, and continued about a month. Since that time the disease has remained nearly stationary, with some occasional fluctuations.

During the first few days of the epidemic, the victims, with *extremely few exceptions*, were of the lowest classes. So noticeably was this the fact, so prompt and terrible was

their death, that these classes, incredulous of the existence of cholera, accused the government, and the physicians leagued with it, of an infernal conspiracy to carry them off by poison. To the horrors of the cholera, which in its desolation resembled the destroying angel more than an ordinary disease of our race, were added those of an infuriated excitement which defies my powers of description. Figure to yourself that Paris commonly contains nearly a million of inhabitants, a very large portion of whom form a class to which happily we have no parallel in our country; and this class in a state of bloodthirsty frenzy, compared to which the common forms of insanity are mildness, and you will have a faint idea of Paris during two or three days. In their fury the populace killed several persons, severely wounded others, and precipitated horses, carriages, and even men, into the Seine. They besieged the doors of the hospitals, which were guarded night and day by armed soldiers. Crowds were collected in the streets, the burden of whose conversation was "*poisoning*." Raising the cry of a "*poisoner*," they pursued individuals with the ferocity of tigers. They even lay in wait, in chambers, for physicians whom they sent for, pretending to be sick. The eloquent description, by Thucydides, of the scenes acted at Athens while the plague ravaged that famous city, hardly conveys an adequate picture of what passed among us.

My observations on this disease have been chiefly made on patients received in the hospitals—persons, in general, poorly clad, indifferently nourished, much exposed to atmospheric vicissitudes, of enfeebled constitutions, in whom consequently the disease manifested itself with the greatest intensity. There were, however, among the robust and muscular, many of the severest cases.

After briefly sketching the progress of a case of cholera during the first days of the epidemic, I will resume the consideration of symptoms, for the purpose of describing them

more in detail, with some modifications they underwent in the course of the epidemic, and of dividing the disease into stages with reference to its treatment.

A diarrhœa, of a few days' or hours' duration, so slight perhaps as to be disregarded; slight general indisposition; impaired appetite; a slight headache, were pretty common precursory symptoms. Oftentimes the patients were in good health, and engaged in their usual occupations on the day of attack. To denote the suddenness of the invasion in some cases, the patients compare it to a blow of a club,—"*coup de baton.*" Frequently the patient awakes in the night with an earnest desire to go to the water-closet; or he experiences this sensation, or is struck indescribably on rising in the morning, or soon after. A sudden and great increase of a previous diarrhœa, or a violent inclination to have a passage, without pain, is in most cases the first symptom described by the patient. Vomiting occurs simultaneously, or soon follows. Cramps occupying the soles of the feet, the calves of the legs, the thighs, and in a much less degree the superior extremities, supervene instantly, or in the course of two or three hours. The patient becomes cold and livid. On his arrival at the hospital, an hour or two after the invasion, he presents that frightful choleric decomposition of the features, of which language can convey no adequate idea: his eyes are sunk and surrounded with a livid circle—the pupils sometimes dilated; face shrunk, triangular, cold and livid, particularly the lips; nose cold and pinched up; tongue cold, moist, livid, and a little furred with white; air respired from the lungs perfectly cold; voice profoundly altered, nearly extinct, or heard only in a feeble whisper, on great exertions, of a peculiar disagreeable harshness, in a few cases quite extinct; ears livid; extremities cold, shrunk, livid or marbled; the skin of the hands, forearms and feet is without contractility, and when pinched up in folds slowly subsides—it is wrinkled like a washerwoman's; cold and lividity some-

times invade the trunk, particularly the sides of the chest; scrotum livid and contracted; radial pulsation extremely feeble or imperceptible; thirst torturing; urine no longer secreted; though the intellectual faculties are unharmed in almost all cases, the patient lies regardless—except to make frequent demands for drink, or when his cramps tear from him distressing cries—mostly on his back, his eyes half closed and turned upwards, his mouth open; he vomits a watery inodorous liquid; his discharges, occurring every few minutes, and made in bed, without pain, and oftentimes even without his knowledge, resemble dirty rice water, and have the odor of stale fish or stale oysters; his cramps are atrocious, and renewed at short intervals; from a vein opened the blood flows not all, or with great difficulty, is of a deep dark color, and at the end of some hours resembles a dark, feebly coagulated, vegetable jelly, and is without serum; respiration slow, and accompanied with more or less præcordial anxiety. In a *very few* cases hickup and delirium supervene near the fatal termination. At the end of four, eight, ten, twelve, or sixteen hours, the patient dies without a groan. In most cases the purging, vomiting and cramps, cease some time before death; and the patient, saying that he is better, sinks so quietly that it is impossible for the looker on to determine when the spirit quits its tenement. If he survives longer, or rather if he is to last a little longer, after some hours an imperfect reaction takes place, he is partially warmed, a feeble pulsation is perceived at the wrist, the vomiting and cramps are less urgent, an abundant viscid perspiration covers him, the decomposition of his features is less frightful; but the eye is injected in a peculiar manner, chiefly that portion of it exposed to the light, in a less degree the part covered by the lower lid, and slightly, or not at all, the portion covered by the upper lid; or an ecchymosis forms in the coats of the eye; or, finally, a thin pus is secreted. The patient at length falls into a stupor, and dies without

the slightest struggle, twenty-four, thirty-six, or forty-eight hours after the attack. Sometimes the reaction is more perfect, the purging, vomiting and cramps, disappear entirely, or nearly so, and hopes of recovery are entertained for two, three, or four days, when the patient manifests inclination to sleep, his face becomes flushed, his eyes injected, and in despite of revulsives or excitants, depletion local or general, stupor and coma succeed, sometimes accompanied with delirium, and he dies with the usual cerebral symptoms. Sometimes persons are brought into the hospital in a state of the profoundest stupor, resembling dead-drunkenness, if I may use such a word in describing so awful a disease, from which they cannot be roused; and often the only account we can obtain from their friends, is that the patients were found in this state, perhaps in their chamber. Death succeeds as quietly, in a few hours, as we sometimes see sleep follow intoxication. This disease is sometimes still more rapid in its progress. A woman, walking on the Boulevard, in the neighborhood of Neckar Hospital, was seized with cramps; she fell, and before she could be placed on a litter, was dead.

Such was the progress of the disease, with slight variations, and such too its terminations, with individual exceptions, during the first days of the epidemic. The course of the disease, when followed by recovery, will be described farther on. Indeed, it would not be a very great exaggeration to say, that the recoveries during this period were too few to furnish the materials for a general description: for of the one hundred first cases received at Hotel Dieu, it was never pretended that more than four were cured; and it has been shown that three of these four never had the cholera; that is, one cure in ninety seven! I am, however, clearly of opinion, that those who after the development of a more perfect reaction, sunk beneath cerebral symptoms, were in general recoverable by means hereafter to be mentioned, though experience clearly proved to me, that they could not

sustain local depletion sufficient to overcome the determination of blood to the brain.

From its first appearance, the epidemic was gradually undergoing considerable modifications, which were quite noticeable at its stadium, and more especially about the commencement of the period of decline. By these modifications of the cholera, I mean that when meliorated and less rapid, it permits the development of symptoms lost under the violent ataxic form assumed by almost all cases that fell under my observation during the rise and part of the stadium of the epidemic. As it has since preserved this ameliorated character in most cases, as it is against these alone that the efforts of the healing art are directed with any reasonable prospect of success, I shall have this less rapid and modified form chiefly in view hereafter, occasionally glancing at any variety of symptoms as appertaining to the different epidemical periods. In the mean time the epidemic influence had shown itself in an immense number of the inhabitants of this city, with every possible degree of intensity, from the slightest perceptible indisposition to the most violent form of cholera. However mild the indisposition, the experienced eye rarely failed to recognize the choleric impress. When the derangement of the health was so considerable as to require medical aid, some of the essential symptoms of declared cholera being absent, it was denominated a *cholerine.* In many cases the cholerine, if carefully examined, was found to be the first or forming stage of cholera; in others, the cholerine constituted all the disease likely to be produced by the epidemic influence, rendering the patient, nevertheless, very liable to an attack of confirmed cholera. I will take up the consideration of this subject more at large in another place.

FIRST PERIOD, OR STAGE OF FORMATION.

In many cases, particularly during the rise and stadium of the epidemic, this stage has been wanting, it being impossible to detect any precursory affection. In these cases the cholera was ushered in without any premonitory symptom, by a sudden, indescribable, momentary sensation of being "seized with the cholera," with extreme weakness, so great sometimes as to produce the fall of the patient. The patient tries to convey this idea by representing himself as struck as it were with a blow—"*frappé comme d'un coup de baton.*"

Most commonly, however, as a precursory symptom of cholera, there is a diarrhœa of some hours', generally of some days' duration. This diarrhœa, consisting of fecal and bilious matter at first, becomes more liquid, watery, whitish and urgent, up to the time of invasion. The matters are rendered with briskness, but without local pain or tenesmus. In some few cases I have known the diarrhœa, after having existed for a few days, to be checked without the use of any remedy, and complete constipation, for several days, precede the declaration of cholera. In a few other cases, I have seen, as a precursor of the disease, a confined state of the bowels, without previous diarrhœa. Accompanying the diarrhœa, or existing without it, we find as prodromes one or more of the following symptoms, viz:—a feeling of general indisposition; impaired appetite, with viscid salivary secretions; borborygmies, with slight colics; slight vertiginous headaches; hearing impaired in such a way as imperfectly to guide the intonations of the voice; coldness of the extremities; dull, numb, nervous pains or sensations, amounting almost to cramps in the calves of the legs; a general nervousness, occasioning fitful slumbers instead of refreshing sleep.

A usual prodrome of the cholera is a cholerine, that is, some of the symptoms of cholera in a decided form, with the absence of others, which are essential characteristics of a fully developed case.

I have mentioned a little in detail these prodromes, an assemblage of any of which I have denominated the stage of formation; not for their importance by themselves considered, but as the precursors of a very fatal disease. They occur in a vast majority of cases, and by obviating them the disease *in forma* is apparently prevented. During the prevalence of cholera they should by no means be neglected; for if they do not always precede a formal attack, we are quite sure that they render a person very liable to one. This stage, then is characterized, by derangement of either the digestive apparatus, or of the innervation, or of both.

SECOND PERIOD, OR COLD STAGE.

We might here, perhaps, in strictness, introduce a stage of invasion; but as this would be in all cases extremely short, and in a vast majority only another name for the commencement of the cold stage, neither requiring nor admitting any variation in treatment, I forbear to introduce it. I prefer, too, to distinguish the present as the *cold* stage, in preference to any other name, since in all cases there is a noticeable diminution of the temperature. Objections might be urged against most other names, such as the *blue period*, &c.

This stage is the commencement of the disease in form. The time of invasion is usually between nine at night and nine or ten o'clock in the morning. Attacks, however,

occur at all periods of the twenty-four hours, more commonly in the morning or late in the afternoon than near mid-day. Whatever may have been the severity of the precursory symptoms, the patient can tell, to a minute almost, when the disease commenced. "He was struck"—"he was ascending or descending a flight of stairs"—"feeling a little indisposed, he took a cup of coffee, which he vomited in a few moments, and an instant afterwards had a liquid stool"—"he awoke in the night with an inclination to go to the water-closet; while there he vomited, or was seized with cramps:" or, "he experienced this last train of symptoms soon after rising in the morning." This sensation of being seized with the cholera, which was more dramatically marked, if I may so speak, during the first period of the epidemic than subsequently, but which exists in a greater or less degree in all cases, is resolvable, as near as I can judge, into a sense of sudden extreme weakness.

Of the previous diarrhœa, a sudden and great increase, or the supervention of it upon the other prodromes, with a sense of great debility, are in a very large proportion of cases the first symptoms described by patients. The diarrhœa is not unfrequently preceded by the vomiting, more rarely by the cramps. A few minutes after, the attention of the patients and the standers by is directed to other symptoms. The extremities, particularly the feet and point of the nose, are cold: and in a small proportion of cases there are chills. On examining the hands and feet, it is perceived that they are slightly discolored, of a deep crimson approaching purple. The coldness and discoloration having occupied the parts remotest from the heart, increase and approach the centre of the system. The choleric decomposition of features appears at the same time, and soon becomes frightfully cadaverous. The pulse, slow and feeble, rapidly declines in force and frequency, till it is extremely tenuous or entirely disappears. From this time forth urine is no longer secreted. The

purging, vomiting and cramps continue, and the patient at length presents the following appearance and assemblage of symptoms:—The extremities are cold, shrunk and livid, or marbled. The skin of the hands and forearms, and in a less degree of the feet, is wrinkled like a washerwoman's, has a peculiar moist feel, and when pinched up in folds very slowly regains its former state. In proceeding towards the body, the lividity of the limbs degenerates into purple patches, and at length assumes a marbled appearance. The extent of the lividity varies, of course, according to the severity of the case. It approaches higher proportionally on the inferior than on the superior extremities. The point of the elbow and the kneepan are often livid, while surrounded by a zone of nearly the natural flesh color. The scrotum is livid and contracted. Coldness and livid patches sometimes invade the trunk, particularly the sides of the chest. The face is shrunk, triangular, cold and livid, particularly the prolabia. The nose is pinched up and cold; its mucous membrane covered with a pulverulence, extending deep into the ethmoid cells: this pulverulence was most abundant when the patients were vacillating between the cold stage and ill sustained efforts at reaction. The eyes are sunk, in appearance atrophied, surrounded with a deep livid circle, and when the patient reposes a moment, the globes, turned upwards, exhibit the white portion between the unclosed lids. The ears are livid and cold. The mouth is moist, with a pretty abundant clammy, or even pasty secretion. The tongue is cold, moist and livid, or pale, having on its upper surface a slight whitish fur. The air respired from the lungs is cold, and has a peculiar sourish odor. The *perfectly* cold respiration is, however, rather rare to be met with since the stadium of the epidemic. Respiration is performed chiefly by the muscles of the chest, unassisted by the diaphragm and abdominal muscles. It is slow, at times somewhat anhelating, with præcordial anxiety. This has

seemed to me to depend in part on the general prostration of the animal forces. Whether decarbonization of the blood is well performed, I have made no experiments to determine. The voice is profoundly altered, heard in a shrill whisper, and on being exerted, it *breaks* with a peculiar raucous harshness. Sometimes it is entirely extinct. Speaking fatigues the patient. In one severe case of cholera, where the voice was for a long time extinct, it was not till the patient was advanced many days in convalescence, that she was able to utter any sound whatever. And so rigid were the vocal organs, that it was some days after the complete recovery of the power to utter loud sounds, before she could articulate intelligibly the simplest sentence, or even single words.

Notwithstanding the refrigeration of the surface, which is always present in a greater or less degree, some patients complain of a burning heat; in others, the sensation of the cold is natural. The thirst is always torturing; some swallow ice with the greatest avidity; a large number prefer warm beverages, and others are indifferent on this point, demanding only some liquid.

The abdomen is very sunk, and has a doughy feel under the fingers: in a small proportion of cases it is of its natural suppleness. In very many cases, neither the abdomen nor epigastrium is painful on pressure; in others, the pain is considerable, and accompanied with præcordial anxiety. Pain, and a sense of oppression at the epigastrium, bear *no relation* to the *severity* of the disease. Not unfrequently there is a dull vertiginous headache, rarely severe, occupying generally the supra-orbitary region. The headache sometimes exists without, at others it is accompanied by slight tinnitus aurium. The patient sometimes describes the sensation in the ear, as the blowing of a current of air; more commonly he likens it to that confusion of sounds we hear when rolling in a chariot over a pavement. We also find,

in some cases, a little deafness; and patients complain that their ear does not assist them in regulating the intonation of their voice. When not tortured by his cramps or thirst, the patient is more or less somnolent, but not comatose, except a short time before the fatal termination of this stage. When questioned, he answers slowly, but correctly. The intellectual faculties are preserved in their integrity, except in a *very small* number of patients. The mental derangement of a patient, who otherwise appeared to be in a state of asphyxia, strongly simulated delirium tremens. Some are fearful of the termination of their disease; others are perfectly indifferent, and the latter are considerably more numerous than the former. I have seen a mother, apparently in the full possession of her *intellect*, request her two daughters to leave her, and not to trouble her. It was the last time they ever saw her alive; she died a few hours after.

The suppression of urine causes no uneasiness whatever; so far from it, that it is sometimes asserted by the patient that urine is rendered as usual, when a careful examination shows the contrary to be the fact. If an attack of the cholera occurs during the menstrual period, this secretion is arrested. After having been thus suppressed for some days, I have known it re-established during convalescence. All the pregnant women received in our hospital, attacked with cholera have aborted and borne dead children. This number, however, was small, only four. The secretion of milk is not suppressed in suckling women. In one very interesting case, of a woman with a sucking infant, who recovered, the milk was drawn off with avidity by a puppy.

From a vein opened in this stage, the blood flows out mechanically, as if from a dead body in which the blood has not coagulated. It is of a very dark color, coagulates very feebly, and furnishes very little or no serum. J. Jackson, jr. of Boston, and myself, saw a dead man, who had been some hours in the Salle de Morts, at Neckar Hos-

pital, move his arms and legs, his eyelids, and open and shut his mouth several times. From one of the venæ comites of his arm, we obtained, as well as I can estimate, nearly a quart of blood. The flow of blood was assisted by agitating the body generally, and by pumping it out, as it were, from the central parts of the system, on elevating and depressing the parietes of the chest. I repeated the experiment on other dead bodies, and could perceive no difference in the flow of blood from one of their veins and from the vein of a living cholerique opened in the cold stage. From the vein, of a person in this stage, left to itself, a few drops of blood slowly exude.

In this stage, if there has been no precursory diarrhœa, the alvine discharges consist at first of alimentary matter, colored as usual by bile; but they soon become characteristic, and contain no traces of bile. When a diarrhœa has preceded for a few days the explosion, the evacuations are from this moment such as are peculiar to cholera. They are very frequent, liquid, of a grayish white color, resembling dirty rice water; frequently of an odor which, to me, resembles that of stale oysters. A kind of passage which I frequently met with in the first periods of the epidemic, but which I have rarely seen of late, is somewhat turbid, of a darkish brick color, which, on being exposed to the air, is soon changed to a dirty brown. The odor I cannot easily describe, though it is familiar to me: may I be permitted to call it a sourish stink? It is this variety of alvine discharges which, I suspect, has been mistaken by some for sanguinolent. I have never *seen* a bloody discharge from a choleric. Stools of a greenish hue are not unusual; they occur more commonly when the system is vacillating between refrigeration and feeble efforts at reaction. There are other slight varieties in the color of these discharges, which it would be useless and tedious to describe.

These evacuations are invariably very liquid, rendered

with briskness, made without pain, without tenesmus, and oftentimes without the knowledge of the patient. In some mild cases, however, they are preceded by a dull colic. The patient describes them from the sensation as clear, and consisting of water. Of their number, I have found it impossible to form any tolerable estimate: I have hazarded the conjecture, in some cases, that they were at the rate of one hundred in twenty-four hours; and from this number a regular gradation to a very few, or none.

Vomiting. It is not unfrequent to see the vomiting precede the diarrhœa. After the matters usually found in the stomach are voided, the discharges are liquid as water, of a dirty whitish color, semi-transparent, or of a copperas green; sometimes frothy, with little flocculent masses; or, very commonly, modified in color and odor by the beverage of the patient. The green color appears mostly in the same state of the system as where we find green-colored alvine discharges. I have not, among my notes, any case of cramps of the stomach. Vomiting occurs at very various intervals; in some cases every five, ten, or twenty minutes, and so on to intervals indefinitely remote. It is frequently excited by the liquids taken to allay the thirst. It has appeared to me that the vomiting, in this disease, is not more painful than the operation of a mild emetic.

The principal seat of the cramps is the calves of the legs, and in a majority of cases they are first felt here. In others, they commence in the soles of the feet, and attack successively the calves of the legs, and the thighs at the same time with the hands and forearms. In two cases they affected *all the voluntary* muscles, even those of the head and features, producing a strange and horrible expression of the countenance. Since the first epidemic period they are confined, in most cases, to the lower extremities, with a numbness of the arms in some cases. I have not seen the involuntary muscles the seat of cramps.

The pulse, which usually could not be felt at the wrist, in this stage, during the rise of the epidemic, was perceptible in most cases that occurred during the subsequent periods. It was extremely feeble and small, and in frequency a little below the healthy standard. I have, however, seen it full and strong at the commencement of this stage, especially when the disease is ushered in with slight premonitory symptoms. I have remarked, in two cases, that it was perceptible only in one arm. I regret not having examined both arms, more frequently, with this view.

The patient retains the natural sensibility of the surface to external impressions. Blisters and sinapisms generally take effect, and are as painful as usual, though the limb is ice-cold. From this last remark we must except the feet, in very severe cases, and patients in that state of quiet bordering on stupor, which immediately precedes their sinking into the arms of death.

This stage terminated in death or reaction. The fatal terminations assumed two forms. First, where the patient died quietly, as if falling asleep, like those who perish from cold. Secondly, where there is an *effort* at reaction, not sufficient, however, to carry the patient from the confines of this stage into those of reaction. But these terminations have been sufficiently described in the sketch which I gave at the commencement.

The characteristic symptoms of this stage are, purging, vomiting, cramps of the lower extremities, choleric decomposition of features, profound alteration of the voice, absence or extreme feebleness of the pulse, great thirst, non-secretion of urine, general prostration, coldness and discoloration to a greater or less extent of the surface, integrity of the intellectual faculties.

The sensibility of the epigastrium on pressure, the headache and tinnitus aurium, the sensation of cold or heat, the preference of warm or cold beverages, anxiety or indifference

about the termination of the disease, are absent or reversed in the severest cases, and bear no relation whatever to the mildness or severity of the disease in any case.

THIRD PERIOD, OR STAGE OF REACTION.

When the second period or cold stage terminates in reaction, we find that some hours after the invasion, the pulse, before imperceptible, or extremely small and feeble, is felt, or becomes a little fuller, the surface is gradually warmed, the cadaverous decomposition of the features in part or wholly disappears, the countenance is a little flushed, and the purging, vomiting, and cramps most generally are less urgent, or entirely cease. These changes take place very gradually. In many cases before reaction is firmly established, there are short efforts at this state with temporary development of heat, succeeded by a return of cold. These vacillations between heat and cold seldom continue longer than a few hours. I have, however, known patients remain in this state for days, and eventually recover. Reaction puts on different forms, and is of various degrees of severity, not always proportionate to the violence of the previous symptoms.

Sometimes the reaction seems gradually to augment, the functions to resume their play and increase in vigor, until they have arrived at the standard of health—or perhaps I should say to a *healthy balance.* The augmentation of reaction is then arrested, convalescence commences, there then remains no adverse symptom so considerable as to require being obviated, except general debility and a state of

the system very liable to relapse, both which demand the strictest attention to external warmth, and the most careful observance of diet.

Imperfect Reaction. In other cases, reaction, though declared, is imperfect. The efforts of the system at reaction are sometimes so feeble that the patient vacillates, as I have before mentioned, between a state of heat and cold. At other times, these efforts are more powerful, but yet insufficient to produce a complete reaction. These states or degrees of reaction I have embraced under the name of *Imperfect Reaction.* It is characterized by prostration, more or less, considerable coldness, slight lividity, occasional cramps, with persistence of the vomiting and purging much abated in frequency and violence, and a continued suppression of the urinary secretion. The nasal fossæ are lined with a dirty grayish pulverulent matter. The liquid vomited is usually of a bright green hue; when it contains bile the omen is favorable, and indicates the near approach of a more complete reaction.

It is in this state of imperfect reaction that we see, very frequently, ecchymoses formed beneath the conjunctiva at the inner angle of the eye near the transparent cornea, and on a portion of the sclerotica exposed to the light. As this state proceeds towards a fatal termination, ecchymoses form in the same manner near the external angle.

This state is of very uncertain duration. It terminates in death preceded by coma, in convalescence, or in complete reaction.

Complete Reaction comes on in the gradual manner described at the commencement of this period, or it succeeds the state of imperfect reaction. In complete reaction most of the leading symptoms which characterized the second period, or cold stage of cholera, have given place to a new set of phenomena. The prostration is still considerable, but the purging, vomiting and cramps exist no longer. The pulse is full, and in general neither frequent nor hard; the surface is quite

warm; the face flushed; the eye slightly injected; mouth dry; thirst considerable, but much less urgent than in the cold stage; the tongue is red, dry, and rather harsh; the abdomen, instead of being sunk in as during the previous period, is of its natural suppleness, most commonly a little distended and slightly painful on pressure. The patient is a little drowsy, and harassed with flighty dreams by night. The suppression of urine continues for some time, generally for several days after the complete development of reaction; and the reappearance of this secretion, though of very favorable omen, is marked by no crisis.

Not an inconsiderable proportion of cases, however, presents, in this state, symptoms of greater severity than those just described. It is in this state that we meet with typhoid symptoms. The brain is more or less affected, from somnolence to complete coma. The face is greatly flushed, and the eyes highly injected, with intolerance of the light; the tongue is very dry, and coated with a harsh black fur; sordes appears on the teeth and lips. Occasionally slight deafness attends, with confusion of the ideas, and, in some rare cases, delirium.

The typhoid symptoms are sometimes so strongly marked as to deceive the superficial observer; yet have I not seen a case of cholera, which, in any stage of its progress, I considered identical with typhus fever. *Carphology;* a peculiar way of looking and answering when spoken to; a peculiar feel of the skin, different as it is exposed to the air or covered by the bed-clothes; lying on the back, with a disposition to slide down in the bed; and *typhomania*, I have not seen in cholera. The pulse, too, in this stage of cholera, is generally large, and very soft and slow. Cholera, in this stage, *sometimes* resembles less typhus fever than those typhoid and nervous symptoms which occur in the sequel of protracted cases of bilious fevers in the southern United States, when, having lost their remittent, they assume a

continued type. I do not deny that genuine typhus may succeed cholera; so far from it, that I am clearly of opinion, that this latter disease may be, and sometimes is, converted into the former. I only wish to say, that I have not seen in cholera some of the symptoms which I consider essential characteristics of an exquisitely marked typhus.

The epidemic, as I have before remarked, has presented some slightly modified appearances at different epochs. Typhus symptoms were of very frequent occurrence about the middle of April, when the epidemic was at its maximum of intensity. The disease then often simulated that form of typhus described by Hildenbrand. For some time afterwards typhus symptoms were rare. As the epidemic became greatly aggravated, about the middle of July, it often presented another form of typhus, almost identical, in many of its leading symptoms, with the very rapid disease known on Connecticut river under the name of spotted fever.

The most constant, unmanageable, and fatal symptom, one, indeed, which I am, at times, disposed to think characteristic of this state of reaction, is the cerebral congestion. Most of the other symptoms seem to depend directly from this, and they increase or diminish in intensity in proportion to its severity or mildness. While the case is apparently proceeding very favorably, this symptom creeps on very insidiously, first showing itself in a degree of drowsiness, which, if not obviated soon, augments to stupor; and it occurs with great pertinacity, after having been repeatedly subdued. We find, accompanying the cerebral congestion, or in some rather rare cases existing alone, other local affections; sometimes of the lungs, indicated by a slight cough; more frequently there is some inflammation of the stomach, producing tenderness of the epigastrium. These latter affections are generally slight, often absent in the severest cases, and bear no relation to the intensity of the previous symptoms.

There is sometimes in this period a slight cough, the sequel of previous pulmonic congestion.

If the termination of this state of reaction is fatal, the drowsiness increases, other symptoms are aggravated, and the patient dies comatose. If the patient recovers, the unfavorable symptoms disappear very generally *without a marked crisis.* The eye loses its injection, the countenance its flushed appearance, the stupor or drowsiness vanishes, the mouth and tongue become moist, the skin less harsh and of its natural temperature, the patient urinates and has refreshing sleeps. These changes take place gradually, and some of them successively, and convalescence is declared.

CONVALESCENCE

From cholera presents little that is peculiar in contradistinction from that of any other very severe disease. It is sometimes very rapid, at others very protracted, and is not regulated in this respect by the severity of the preceding disease. Some few patients who have suffered very violent attacks of cholera, have been able to return to their usual occupations in four or five days. I have known other comparatively mild cases, in which the patients have been confined to their beds for three months.

During convalescence there is great liability to relapse, from fatigue either of body or mind, from exposure to the air, or from slight errors of diet. And this liability exists, after the patient is apparently perfectly restored. Diarrhœa recurs during this period, frequently without any assignable cause. During the first few days, there is also considerable liability to a return of the cerebral congestion, with the accompanying symptoms already described.

In a few rare cases, I have seen very moderate epistaxis followed by the removal of some slight remains of cerebral congestion.

One case of swelled parotid with suppuration, occurred in this period without promoting or hindering the march of the patient towards complete recovery.

In one case an abscess formed in the left ear, discharging a whitish, turbid matter. The discharge gradually diminished and disappeared at the end of several days, without seeming to affect the progress of convalescence. This case, as well as that of the swelled parotid, were the only examples of the two affections that occurred among upwards of two hundred patients.

Among the same patients there occurred a single case of intermittent fever. The patient had several paroxysms of a double quotidian.

Among five hundred choleriques I have not seen or known a hemorrhage to occur from any part, except the *moderate* epistaxis, of a few drops, in a *very small* number of patients during convalescence.

APPEARANCES ON EXAMINATION AFTER DEATH.

I HAVE been present at sixty-five autopsies, most of which I made myself. But on this head I shall be brief. The *post mortem* examinations of M. Louis, collected by my friends doctors Gerhard and Pennock, of Philadelphia, are perhaps already in possession of the American medical public, as I hope will also be those of M. Andral, collected by my friend J. Jackson, jun. of Boston. The minuteness and accuracy of the examinations made by MM. Andral and

Louis, probably the first pathologists of the age, and recorded on the spot by Messrs. Jackson, Gerhard and Pennock, who have devoted themselves particularly to the study of morbid anatomy, though they may leave much to be desired, will leave little or nothing more to be revealed by the scalpel. I shall therefore content myself with describing these appearances in a general manner.

In the body which was cold as marble while animated by the immortal spirit, there is after death a disengagement of heat that diffuses a genial warmth for twelve or fifteen hours after the extinction of life.

The body presents externally the blue choleric discoloration. Cadaveric rigidity is very great; the muscles moving the feet, are in an especial manner powerfully contracted. The muscular system in general is very dry, as of an animal bled to death, and is unusually dark colored.

Brain. Dura mater sound. Arachnoid membrane somewhat injected and discolored, with serous infiltration beneath it, in some few cases. The substance of the brain is nearly natural, rather firm, and presenting a very smooth, moist, and I might almost denominate it, oily section when cut. It appeared in some cases rather more *pointed* with blood than is usual. A little fluid was sometimes found in the ventricles, particularly in protracted cases, wherein death had been preceded by cerebral congestion.

Thorax. Lungs healthy, often a little emphysematous from the dying efforts at respiration. Their posterior portions were quite dark colored, which I take to arise from the body being laid on the back after death. Heart and first portion of aorta contain a large quantity of very dark and very slightly coagulated blood. The left ventricle frequently presents the appearance of *hypertrophy*. Polypous concretions at times exist, but less generally than in persons dying from other diseases.

The serous membrane of the thoracic cavity, as well as

the peritoneum and peritoneal coats of the abdominal viscera are sound and *dry*.

Abdominal cavity. The alimentary canal is more or less discolored externally. The duodenum and first portion of the jejunum present this discoloration in the greatest degree. This in different cases varies from a rose color to that of brick or Spanish brown. The stomach and large intestines are much less discolored, or quite natural. This color of the alimentary canal arises from the injection of the cellular tissue, existing between the peritoneal and mucous coats, and embracing the muscular coat.

The stomach contains from a gill to a pint and a half of a fluid differing in different subjects. It resembles most commonly a slightly turbid whey; at other times it is a greenish liquor, or of a dirty brown hue and turbid. It is often modified by the beverage of the patient, and has small frothy or flocculent masses swimming in it. Its mucous membrane is in general of the usual thickness and consistence, and often presenting red patches, especially where the disease has been violent and of short duration. When the case has been protracted, and accompanied with much tenderness of the epigastrium, we find the mucous membrane red and *pointed* * in patches.

The *small intestines* contain a fluid varying in color and consistence in different individuals, and in different parts of the same alimentary tract, usually more consistent than that found in the stomach. It resembles commonly dirty rice water, or a thin starchy fluid; sometimes it is glairy or creamy. During the first few days of the epidemic I often found in these intestines a turbid brick-colored liquor. This latter was subsequently only rarely met with. Their mucous membrane is somewhat injected, and covered with an ad-

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* Pointillé.

herent creamy mucus. Some consider this layer of mucus as peculiar to cholera. M. Majendie says he finds it in persons guillotined. The color of the mucous membrane corresponds very nearly with that of the intestine when viewed externally; and on raising this membrane its color is perceived to be owing chiefly to the same cause, viz. to the injection of the subjacent cellular tissue. Occasionally there are introsusceptions, and more rarely there are lumbrici.

The glands of Bruner and Peyer, situated in the coats of the intestine, are somewhat enlarged. I have not, however, examined these glands in persons dead of other diseases sufficiently often to advance an opinion as to the importance we are to assign them among the morbid appearances of cholera. From their size, number, and situation in the lower part of the small intestines, I am not disposed to consider it very great.

The *large intestines* generally present in some part of their tract, appearances similar to those just described, but limited in extent, and much slighter in degree. In other cases, the mucous membrane is of unusual whiteness. We sometimes meet with patches near their termination which are apparently cadaveric ecchymoses. Indeed, it is only in some few cases that I have considered the large intestines as having suffered any considerable pathological changes. They are frequently contracted, and contain small quantities of a liquid similar to some one of those found in the small intestines. Occasionally they contain a dark brown liquid which is destitute of fetor.

I have never seen, even in its incipient state, gangrene of the intestines. Nor have I perceived any remarkable tendency to putrefaction, either of the solids or fluids of the system.

The *liver* is in appearance perfectly healthy, though the secretion of bile has ceased from the invasion of the disease. It is generally very dry and free from blood. In a few cases

the large vessels of the liver have contained uncoagulated blood; but this I take to be in most cases an effect produced after death by mechanical causes. The *gall bladder* is in a few cases much distended. It is generally moderately full of a dark colored bile. In two instances I have found in it a nearly transparent liquid, resembling a solution of gum arabic.

The *spleen*, *pancreas*, and *kidneys*, are found in a healthy state. The kidneys, from the position of the body, often contain blood in their large vessels.

The *bladder of urine* is empty and contracted. The small quantity of mucus found in it, is clearly only another proof that the mucous tissues are more tenacious of life than some others; and is analagous with the growth of the beard after death. In four protracted cases, which occurred during the decline of the epidemic, I found the bladder containing a considerable quantity of urine.

The ganglionic system of nerves doubtless plays an important part in the production of choleric phenomena; after considerable examination of them, however, I do not believe that the scalpel reveals any perceptible changes in their appearance or structure. The great posterior crural nerve, in several instances where I examined it, was gorged with blood. How far this is a pathological state I am unable to say.

Such in general were the appearances found on examining the bodies of those who died in the cold stage, or after a short or an imperfect reaction. When a protracted reaction preceded death, the autopsic appearances corresponded to the supervening local affections observed during life, such as water in the ventricles of the brain, and in some cases, unequivocal marks of inflammation of the stomach.

In cholera, is there *inflammation* of any part of the alimentary canal? After all that has been said on this subject it is in some measure a dispute of words. Those of us

who have seen much of the cholera, know very well what the autopsic appearances are; but until medical men agree on what constitutes inflammation, it seems almost useless to vex this question when speaking of cholera, especially when we know, that this definition of words being settled, we are not advanced one step in the treatment. I will however devote a few words to this subject.

If we take the local affection, either of a gastro-enterite or of dysentery, as the type of inflammation of the mucous membrane lining the alimentary tract, we find that the derangement of the innervation, and the draining of the fluids of the system by means of this mucous membrane, (the symptoms that constitute the essence of the disease, which are, in a word, cholera itself,) exist without some of the usual and important phenomena of inflammation. In many of the severest cases, there is no pain from great pressure on the abdomen; the discharges are attended with no local pain; no tenesmus; often with no sensation.—Seemingly this does not arise from a want of sensibility, for the patient retains this in most respects, as when in health. The tormenting thirst, however, while the mouth is moist and cold, may have an important connection with the pathological state of the stomach. Whether there is a softening or thickening of the mucous membrane, is a question of sensation, and there is some liability to error. In examining this membrane, with reference to these points, I used great care, and made several comparative observations, as opportunities were afforded me by the death of patients from other diseases. It is true, I did not find this membrane the same in all; but the difference I do not conceive to be greater than exists between the stomachs of the robust and temperate and those of the enfeebled and intemperate. The stomach was decidedly inflamed in many cases; but this state was accompanied in most, I believe in all, by the usual symptoms during life, and after death, presented the *pointillé*

appearance and other changes which are consequent on the common form of inflammation of this tissue. These phenomena occurred only in some cases of protracted reaction; I never saw them where the patient died in the cold stage. Nor have I at any period seen inflammation terminate in gangrene.

If, however, *redness alone* is evidence of inflammation, then was there inflammation of some portion of the alimentary tract, more or less marked in every case of cholera of which I made a necropsic examination. This color existed in some degree in the mucous membrane when separated from the other coats of the intestines, but it was chiefly situated in the subjacent cellular membrane or tissue. This rose color of the intestines, which in the severest cases approached a brick color, I consider analogous to the lividity or deep crimson of some parts of the surface of the body; or rather, if I may so speak, as a part of the same fact, and no more an inflammation in one case than in the other. The redness of the intestines corresponded to the external discoloration, and both were in proportion to the drain of fluids from the body, and to the rapidity and violence of the disease. As the epidemic declined, the redness of the intestinal canal became a much less marked autopsic appearance, though pain of the epigastrium was of much more frequent occurrence, and of greater severity than during the rise and stadium.

But the discoloration is not confined to the intestines and surface of the body, it extends in many cases to the uterus, bladder of urine, &c. and even to the bones. It depends, I believe, in some measure, on the stagnation and imperfect coagulation of the blood after death. From the analyses * of the blood given in the margin, we see in

* The following are the analyses of the blood made by Dr. Thomson of Glasgow, and Dr. Reid Clanny of Sunderland.

choleriques, a very noticeable diminution of the coagulating part, and an increase of the coloring matter and carbon. Nevertheless, we are not perhaps justified in supposing that the aggregate of the latter is increased, unless from the imperfect decarbonization of the blood in the lungs. But I wish chiefly to insist on the deficiency of the coagulating part of the blood as shown by these analyses, on its non-separation into serum and coagulum, when drawn from the living cholerique, and on its remaining liquid wherever found in his body after death. The coloring matter of the blood then, instead of being compressed into a small space after death by the coagulating portion, as in ordinary diseases, remains spread out upon, or diffused in the different tissues of the body. No one will deny the great compressibility of the coloring matter, who recollects for a moment the large, feebly coagulated mass which remains of blood drawn from choleriques, and the small coagulum floating, in a large quantity of serum, into which the blood separates that is drawn in some highly inflammatory diseases. I have been thus long, tedious I fear

Dr. Thomson's analyses supposing 100 parts of water in each case.

	Health.	Cholera.
Water	100	100
Albumen	10.79	7.34
Fibrine	5.67	0.57
Coloring matter and albumen	9.42	41.51
Salts	1.65	1.81
	127.53	151.23

Dr. Reid Clanny's analyses.

	Sailor in Health.	Cholerique.
Water	756	644
Albumen	121	31
Coloring matter	59	253
Free Carbon	32	66
Fibrine	18	6
Salts	14	00
	1000	1000

on the discoloration of the intestines, because it is so obvious and constant an appearance, and so liable to lead a superficial observer into error. Were it not my wish to avoid as much as possible speculation, I would trace some interesting analogies between the small circumscribed petechiæ of typhus petechialis and the diffused lividity of cholera, and explain what I conceive to be the cause of this difference.

I could easily have been much more minute on the subject of post mortem appearances, and had I designed to give a complete account of them, I must have necessarily been so.

Before describing the treatment of cholera, I shall make a few remarks on

CHOLERINE.

From the slightest perceptible epidemic influence to the severest forms of cholera, there is every shade of intensity. It is consequently very difficult if not impossible, to draw accurately a line of demarcation. In general, when one or more of the essential symptoms of a fully developed case of cholera, such as vomiting, purging or cramps are wanting, or exist only in a very slight degree, the disease is termed a cholerine. Even in the absence of one of these symptoms, should the others be exquisitely marked, and especially if accompanied with considerable prostration, the disease is a decided cholera. When the peculiar decomposition of the features, the discoloration of the extremities, great refrigeration, or suspension of the urinary secretion is present in a case, it may be confidently pronounced cholera. In a cholerine however mild, the experienced eye detects in a slight degree, the epidemic impress on the features.

The stage of formation of cholera, such as has been

described, is properly a cholerine, ready indeed to be converted into cholera by any accidental exciting causes. Sometimes a cholerine is ushered in suddenly, or with a slight explosion, similarly to cholera; at other times the symptoms develop themselves gradually and successively, augmenting in severity till they are checked by remediate means, or terminate in an explosion of cholera.

A brisk watery diarrhœa without tenesmus, accompanied with coldness of the feet and numbness or cramps of the extremities; a sudden sense of weakness with nausea, succeeded perhaps by vomiting; nausea or vomiting with pains in the calves of the legs; coldness, colicky pains with cramps: any of the foregoing combinations of symptoms, always attended with depression more or less considerable of the physical and mental forces, are prominent features in common forms of cholerine. To describe every form, would require the detail of almost every possible combination of the symptoms of cholera, taken several at a time, and of various degrees of intensity.

After all, cholerine is either the predisposing state of cholera, or it is the same disease in a milder degree, produced by the same epidemic influence, exhibiting the same general characters, liable to put on its most aggravated form, and requiring in general a very similar treatment. I have given it a brief separate consideration, partly in compliance with a very general custom, and partly because it is a useful distinction in reference to treatment, and in comparing the statistical results of different methods of treatment. Instead of employing more time in describing it I will subjoin some cases. (*See Appendix of Cases.*)

TREATMENT OF CHOLERA.

Surrounded with treatises whose authors vaunt their success in combating this terrible scourge of our race; in fearful anticipation of encountering it, imbued with what has been written, and decided on the treatment which he will pursue, the practitioner hears that the cholera has appeared in his neighborhood. Perhaps he is anxious to grapple with it, an opportunity is soon forced on him. His patients die in despite of his remedies, it may seem to him, before they have time to produce any effect. He has recourse to other means, and in the circle of change and experiment, to some vaunted specific medicine or method. These, so far from being crowned with success, may seem to hasten the fatal termination. Nearly every individual dies, or if here and there a single one escape, his recovery cannot be attributed to any means which may be confidently employed in the generality of cases. The practitioner is in a state of most painful indecision, yet something must be done. Perhaps he concludes that the first blow is mortal, and that nothing of much use can be done. At least, he is learning one truth, which is confessed by all practitioners in cholera of good faith, on whom experience is not thrown away, viz. that at the commencement of the epidemic, very few of those in whom the disease is fully developed, recover by any means yet known.

Though I bring forward no specific, and profess to know no means which will not leave many to perish, in whom there is a complete development of cholera, yet I hope I have so improved my great and painful opportunities for observation, as to be useful to my countrymen, should this disease unfortunately appear among us,* by insisting on

* See preface.

a recourse to medical aid in the stage of formation when this stage exists, by pointing out the means which I have found useless or prejudicial; and by describing the remedies and treatment, which, though they leave much to be desired, are nevertheless followed by more favorable results than any other which I have known and seen employed.

In the treatment of this disease, many medicines have been extolled as specifics, and by men apparently of good faith and respectable capacity. Yet one of the first facts which we learn by observation, is that the same remedies are not adapted to all cases, and that remediate agents of an opposite nature are required in the different stages of the same case. The best treatment of cholera, I adventure to say after extensive observation, is to fulfil the obvious indications by common medicinal means. I may go farther and add, that looking at symptoms in connection with their causes, as far as we are acquainted with the latter, the soundest treatment consists in obviating these symptoms as they rise.

A large proportion of the cases in which the disease exists in its severe form, are necessarily fatal, whatever treatment be pursued. And many such cases occurred during the first period of its epidemic existence, since then especially, there were explosions without a previous stage of formation. But when the stage of formation exists, as it does in almost all cases since the first few days, I know no severe disease more certainly curable.

During the prevalence of cholera, no diarrhœa or other considerable derangement of digestion should be neglected, as it may prove a precursor of the cholera in form. I believe the principal reason, why the poorer classes have furnished so disproportionate a number of victims, is to be found in their neglect of premonitory symptoms.

When the stage of formation exists, it is of the last importance to have immediate recourse to medical aid, to strangle the disease in its birth. If taken at this period,

the cholera is certainly curable, or its explosion is prevented by timeous remedies. In this stage, which frequently continues for days, an hour or half hour is sometimes of the utmost consequence. M. L. professor of chemistry at the garden of plants, had a slight cholerine of some days duration; while preparing to take some remedy, he was seized with an explosion of cholera, which was shortly fatal.

Upon the occurrence of any of those symptoms which I have described as constituting the precursory stage, or rendering a person very liable to an attack, the patient should confine himself to the house, at least he should avoid considerable atmospheric vicissitudes, especially the night air—if they are at all severe, he should resort to the equable temperature of a bed; and in all cases, he should be restricted to a moderate regimen, avoiding the least excess in eating or drinking, and any considerable fatigue of mind or body. Slight irregularities of diet, which in common times would be harmless, may produce an explosion of the cholera. In a very great majority of cases, diarrhœa is the precursory symptom, and to this the most careful attention should be given. There is a neglect of this diarrhœa amounting almost to a delusion, explicable partly by the fact that it is very rarely painful. It should be obviated by remaining in an atmosphere of uniform temperature, by moderate diet and opiate injections. I have not known any ill consequences succeed the sudden checking of the diarrhœa, by opium thus administered, as a moderate diet has been enforced at the same time.

To remove digestive derangement accompanied with vitiated secretions of the mouth, anorexia, headache, dry skin, &c. a few grains of ipecacuanha should be administered. If a diarrhœa accompany the preceding symptoms, it will generally disappear after the operation of the ipecacuanha. There is no danger of the vomiting producing an explosion of cholera. The state of the stomach in vomiting produced by ipecac,

seems to be different from that pathological state which exists in cholera.

Colics, borborygmies, and nausea, with inconsiderable derangement of the secretions, are best relieved by mint water and paregoric with quiet and abstinence. While the epidemic was at its height, a sensation of numbness in the calves of the legs, more or less severe at times, and occasionally amounting to a slight spasm, occurred almost as a solitary symptom in my own person, and in several of my acquaintances. For this, I found in my own case, relief from frictions, but chiefly from walking briskly half an hour. When the patient complains of coldness, depression of the moral and physical forces, and of the other symptoms which I mentioned in describing this stage, he should go to bed and take some warm tea, containing a few drops of paregoric; and make use, in short, of those means with which every person is acquainted.

In very many cases, simple repose and a mild diet for twenty-four or forty-eight hours, are sufficient to cause the disappearance of those indispositions and symptoms which are so often the prodromes of the disease—and which therefore, though slight in themselves and easily removed, are not unimportant in their consequences.

To arrest the diarrhœas, which are of so frequent occurrence during the existence of epidemic cholera, recourse is sometimes had to purgatives. These I am convinced are much less safe and efficacious than opiate injections. If a vitiated state of the secretions demands their use, we should give rhubarb and magnesia in some mint water. Saline cathartics are attended by the danger of exciting the disease they were intended to prevent.

TREATMENT OF THE COLD STAGE.

If the precursors have been neglected, or if the disease opens by the cold stage, a new set of symptoms is ushered in, infinitely more formidable, and far more difficult to be successfully combated.

On approaching the bedside of a patient, cold as marble, and pulseless, with universal and extreme prostration, agonized with horrid cramps, the surface of his body shrunk, and deserted as it were by the fluids, to supply the great and incessant drain of vomiting and purging, several indications present themselves to be fulfilled. The most important, indeed the essential indication of this stage, is to restore warmth and action to the surface, in other words, to establish reaction. At the same time, we must obviate those symptoms which torture and exhaust the patient. To accomplish these ends, the patient should be put in a warm bed; there should be administered internally a portion consisting of laudanum, mint-water, and sulphuric ether, once every hour, or at longer or shorter intervals, *pro re nata.* Each dose should usually contain about twelve drops of laudanum. The action of the surface should be excited, and the return of warmth solicited, by frictions made with the hand frequently, wet with French brandy, laudanum, camphorated spirits, or something similar; and by the applications, during the intervals between the frictions, of external warmth, by means of bottles of warm water, small sacks of warm sand, &c. Frictions, repeated from time to time, whether made as just described, or in a manner hereafter to be mentioned, have appeared to me by far the most efficacious means of restoring warmth and action to the surface. They answer another important indication, viz. the alleviation of the cramps. To the remedies just mentioned, we should

add the use of opiate injections, and repeat them according to the urgency of the case.

I have often conveyed currents of warm dry air, and of steam, under the bedclothes, by means of a small portable *cheminée.* But some caution is necessary in its use. The temperature should not be raised above blood heat. When somewhat elevated above this point, it has appeared to smother and extinguish the small remnant of vitality of the surface, which it was intended to cherish and sustain. And the more complete the refrigeration, the greater this danger apparently becomes. In this case the patient is annoyed with a sense of suffocation, and endeavors to throw off the bedclothes; soon he is covered with a viscid perspiration, sinks into a quiet stupor, and dies in a few hours.* In determining the degree of heat to be applied, I believe our best guide, in general, is the sensation of the patient. When the

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* At first, I supposed these sinister consequences to be produced by excessive excitation from the heat. The sense of suffocation experienced by the patient when his body is surrounded by this hot *irrespirable* air, and the refreshment he feels on exposure to the surrounding atmosphere, at a moment, too, when perhaps he complains of cold, have led me to a different opinion. It is a fact, confirmed by numerous experiments and abundant observation, that the skin performs a vicarious function of the lungs. Any one may convince himself of the fact, by recollecting the great refreshment and alleviation of his respiration which he experiences, independently of the coolness, on baring his arms and chest, or the whole of his body, when his respiration is affected, either in a fever, or after considerable exertion—or when the atmosphere is very rare, as in hot weather, or suffocating, as during the prevalence of certain winds. Indeed, whenever the respiration is embarrassed, from any cause whatever, a person seeks relief in exposing the surface of his body to the atmosphere. The physiological experiments on this point are quite conclusive, but I have not time to touch on them.

Whatever be the true theoretical explanation of this subject, the fact is, that experience soon led us to renounce the practice of surrounding the patient's body with hot dry air, as well as the use of general frictions with *oily* liniments.

prostration is so considerable that he is regardless on this point, we should use the greatest caution. Such cases, however, are almost always fatal, whatever we do. Still, it is an error leading sometimes to fatal consequences, to suppose that we should apply a degree of heat elevated in proportion to the refrigeration of the patient.

Nothing is gained by covering the patient with many bedclothes, for there being no disengagement of animal heat, the warmth must be produced and kept up by external means.

To allay the thirst, which is always very urgent, some beverage is necessary. This may be some tea, slightly aromatic, as an infusion of camomile, the flowers of the linden tree, orange leaf water, &c. according to the taste of the patient. When the sensation of heat externally is very great, lemonade, ice-cold, or small pieces of ice to be dissolved in the mouth, are very grateful. I forbear to detail a list of teas, tisans, &c. as they are known to all, and may be employed according to the judgment of the physician or taste of the patient, the general indications, however, being always kept in view. In some cases an infusion of serpentaria; in others carbonated waters would, I should suppose, be valuable auxiliaries. As the demand for drink is frequent and importunate, and as it tends, when taken in considerable quantities, to keep up the vomiting, it should be given but little at a time. It should be warm or cold, as preferred by the patient. When the desire for cold beverages is strong, warm ones aggravate the vomiting. From ice, melted in the mouth and swallowed, I have seen no very decided effects, except the gratification of the patient's appetite. It very frequently fails to arrest the vomiting.

The same means that are employed to produce reaction, are also efficacious in checking the vomiting. A composition frequently given for this double purpose, and containing the

articles formerly mentioned, was made according to the following formula:

No. I. ℞. Sir. Cort. Aurant.
Vin. Malaga Opt.
Aq. Menthæ aa ʒi.
Aq. Tiliæ Europ. ʒi.
Etheris Sulfurici.
Tinct. Opii de Rousseau aa ℥i. M.

When a less stimulating one was indicated we used the following effervescing mixture:

No. II. ℞. Aq. distillatæ ʒiv.
Aq. flor. Aurant. ʒss.
Sir. Gummi Arab. ʒiss.
Sodæ Carbonas ʒiss.—ʒii. M.

To each table spoonful of this mixture, in a little water, add one teaspoonful of lemon juice.

These are formulæ that have been frequently employed in the wards of M. Bricheteau; and, for the sake of brevity, I shall hereafter, when I have occasion to refer to them in the cases given in the appendix, distinguish them as mixture No. I, and No. II.

The proportions of some of the articles were occasionally varied to adapt them to the circumstances of the individual case. I am clearly of opinion, that in some cases, there are advantages in selecting the most efficient articles and giving them in a less bulky form.

To alleviate the *cramps* I know nothing equal to frictions. After a very extensive use of vesicatories and sinapisms, my opinion of them is not very favorable. They interrupt the employment of frictions, and are far less efficacious than the latter. In the severest cases they do not draw; when they do, they are painful without controlling the cramps. It is true that frictions require frequently to be repeated, but the relief afforded by them is so great, that the patient often requests them, when his prostration renders him regardless

of almost every thing else. To them as a powerful means of establishing reaction I have adverted above. Frictions made with highly stimulating, oily matters I have not thought, on the whole, equal to those made in the manner and with the substances above mentioned. I have not seen any greater, nor any narcotic or antispasmodic effects from extract of hyoscyamus employed in frictions. Several trials were made of careful bandaging of the limbs, to control the cramps, but without success.

To arrest the purging, to complete and sustain the reaction, a task often very difficult and requiring assiduous attention, an injection of laudanum and starch repeated pro re nata, is highly serviceable. Injections with decoctions of vegetable astringents as rathania, have been employed, but they are less efficacious than those of opium.

A supposed analogy in the state of the cutaneous vessels to those of a person who has been exposed to extreme cold, has led to the employment of frictions with pieces of ice. These were made with great briskness over the whole body; and operated doubtless in some measure as frictions made with the hand or any other substance. The results of this means appear to me more favorable in some respects, than those of any other I have seen employed, especially in cases where the refrigeration was very great. In these cases no treatment could boast of much success—nevertheless, ice frictions, though a forlorn hope, offer some *chances* of recovery. Certain I am, that more than any means with which I am acquainted they seem to husband and augment the small remnant of cutaneous vitality, instead of extinguishing it as does the injudicious application of heat. I have seen the pulse at the wrist which was previously imperceptible, develope itself during the ice frictions and for a few minutes afterwards—then disappear, again become perceptible on the renewal of these frictions, and after several alternations, the patient ultimately recover. Under their

employment the skin loses its blue tint, and becomes red and warm; the cramps are temporarily relieved, and there follows a sense of refreshment. There is also another very important fact connected with them, viz: the stage of reaction which follows their successful employment, is mild and short.

Ice frictions are made by one or two persons on each side of the patient, with pieces of ice as large as the fist; with great briskness over the whole surface, particularly of the extremities, and continued from five to ten minutes. The time should be determined by the fatigue of the patient and the effect on the general and cutaneous circulation. The patient should be immediately wiped dry and placed between woollen blankets. They should be repeated about once an hour, till reaction is established. In the intervals between their employment, bottles of warm water may be applied externally. The internal remedies before mentioned, should be administered at the same time.

Cold affusions I have seen employed, but have not watched their effects with sufficient attention to describe them accurately. The results were not such as to induce the continued use of them.

The great number of patients received daily into the hospital, rendered the general employment of warm baths impracticable. The effects of the introduction of steam under the bedclothes, and the results of a very few trials, did not lead us to anticipate any extraordinary success from them. I can readily believe however, that in some cases, they would be found very efficacious.

By means of the arm bath, rubbing the arm, and agitating the body of the patient, we have succeeded in many cases in obtaining several ounces of blood in this stage. For though the blood will not flow from the circulatory powers, yet having lost in agreat degree its coagulability, it is pressed out mechanically without much difficulty. From a theo-

retical conjecture that the organs of life were obstructed in their play by the blood dammed up in the large vessels, and from the great fatality of the disease under other treatment, this experiment of venesection was continued longer than any apparent success would otherwise have justified. Of a great many patients who were bled while cold and pulseless or nearly so, I have not seen one, in whom this operation was followed by any advantage. Indeed I know not what advantage could be rationally anticipated from abstracting a few ounces of blood from a mass unfitted in a good degree for the purposes of life, and when drawn presenting appearances and possessing qualities, unlike or quite the reverse of those of the sizy blood drawn in inflammatory diseases. At the moment of explosion or very soon after, when the violent derangement of the circulation and flight of the blood from the surface are commencing, while radial pulsation is still pretty strong, and before refrigeration has taken place, venesection as a perturbator of the perturbed action, if I may so speak, may be of considerable service, as I have seen in several cases. In these cases, the pulse was full, and in general neither hard nor frequent; though each pulsation was made with a kind of hurried excitement.

An attendant was attacked in the hospital with vomiting, purging, cramps in the calves of his legs, and a sensation of immense weight upon the præcordia, simultaneously. His pulse was full, not frequent, rather agitated. Coldness of the extremities commencing; surface of the body otherwise warm. He was immediately bled twelve ounces; fifteen leeches were applied to the epigastrium, which were followed by the alleviation of the weight on the præcordia. The internal remedies already mentioned were given, frictions and warmth were applied externally. Refrigeration in this way was prevented; the action of the heart and arteries sustained, and the particular symptoms obviated.

The patient was subsequently bled a second time twelve ounces, and recovered without any adverse symptom.

When, however, the circulation is noticeably more feeble than in health, or refrigeration prevails to any great extent, as happens in all cases shortly after the attack, if they are neglected, venesection is prejudicial.

Sinapisms and blisters, which have been considerably employed in this stage, I have found of but little efficacy in controlling the cramps.—As external excitants to prevent refrigeration, and subsequently when the system is making feeble efforts at reaction, sinapisms applied so as not to interfere with the use of frictions, and only long enough to redden the skin, are of service. A sense of oppression and weight about the præcordia is mitigated by stimulating poultices, made of linseed and mustard, powdered and moistened with aq. ammoniæ.

Excitation along the spine I have produced in various ways and in different degrees without any benefit.

Galvanism I have seen employed at first with the appearance of some benefit, but its use was soon renounced.

Ipecacuanha, while the coldness and prostration are great, the vomiting urgent, and before any attempt of the system is made at reaction, is rejected in the course of the vomiting without any perceptible effect. The precious moments immediately succeeding the explosion, I should be very unwilling to waste in the tardy operation of ipecacuanha. When reaction is imperfectly developed, and the patient is passing from one to the other, or struggling between the two stages, a dose of ipecacuanha opportunely administered arouses the powers of the system as it would seem by concussion, and enables the patient to clear the limits of the cold stage, and enter those of reaction.

Punch so highly commended by M. Majendie, I have not seen employed, as all the advantages that could be expected

from this kind of remedy, we obtained with the mixture before mentioned and good Malaga wine.

Charcoal was administered in several cases, but with effects so unimportant as not to lead us to persevere in its use.

Individual recoveries are pompously announced of persons who have breathed some of the gases, as oxygen, and nitrous oxyde gases. But the success of their patrons has not yet been so great as to lead to their employment by practitioners, who, though extremely anxious to discover a method of curing the cholera, are not pledged to patronize any exclusive treatment.

I have not yet seen saline injections into the veins employed. It appears from the result of some experiments made in Paris, as well as statements received from London, that the shout of victory has been prematurely raised. Nor do I perceive the necessity of this method of medication, since absorption, though less active in the cold stage than in health, is still performed.

Camphor, cajeput oil, and the host of specifics, I will dispatch with remarking the fact, that they have not sustained a use of forty-eight hours, in the hands of those who profit by experience.

In summing up the treatment of the cold stage, we find that the leading indication is to establish reaction, that, as this takes place, the vomiting, purging and cramps are gradually diminished or entirely subside; that these ends are effected, not by any single medicine, or exclusive method of treatment, but by common remediate means, selected and employed according to the intensity of the symptoms, and adapted to the circumstances of each case individually considered.

The leading points of treatment, I will adventure to repeat, in order to present them under a single *coup d'œil.*

The patient on being taken should be immediately put to bed, warm applications made externally, frictions frequently

and briskly made, twelve or fifteen drops of laudanum, with some oil or water of mint, administered in some warm brandy or generous wine, and repeated *pro re nata*; injections containing from twenty to sixty drops of laudanum should also be administered and repeated if necessary; as a beverage, some mild aromatic tea, in small quantities, and warm or cold to suit the taste of the patients. If unfortunately the patient has become quite cold, caution is required in the application of heat, or this may be replaced by ice frictions. If the patient is seen immediately after the invasion, and the pulse be full, pretty strong, and somewhat excited, as I have seen it in a small number of cases, he should be bled. When by these means varied according to circumstances, the pulse becomes perceptible or fuller, the surface gradually warm and losing its discoloration, and the other symptoms are diminishing or disappearing; our remedies should be modified, gradually diminished or withdrawn.

The difficult point in the treatment of cholera is the producing of a complete and free reaction. When this is fully developed, though the state of the patient is attended with danger of life, and requires a very careful and timeous administration of remedies, we may in general pronounce him recoverable.

When the treatment which I have detailed is put vigorously into execution, at the commencement of this stage, before the patient becomes cold and the circulation greatly enfeebled, we may anticipate a favorable issue of a large proportion of cases. But when the refrigeration is complete, and that assemblage of symptoms exists, which I have attempted faintly but faithfully to describe, I am most fully persuaded, that human means are inadequate to the restoration of *many* of the patients. Many hours even, before they are moribund, there does not remain sufficient vitality to produce reaction; or, if this is forced for a few minutes, the common play of the functions soon exhausts the small share of excitability that is left.

I have insisted from time to time in the course of my remarks on the great, and to a considerable extent, *unavoidable* mortality of cholera, because it is a *fact*, and my object is to relate *facts;* because authors in vaunting remedies and methods of treatment, lead us to anticipate results, which *it is certain they themselves never obtained;* and, because I wish as much as in me lies to urge the necessity of employing remedies, the moment any choleric symptom shall present itself, during the prevalence of this epidemic.

TREATMENT OF THE STAGE OF REACTION.

In the treatment to be pursued during reaction, it is necessary to bear in mind the different forms or degrees of reaction into which I divided this stage when speaking of its symptomatology. As it is being developed, we should diminish or discontinue the remedies employed in the second stage, carefully watching its progress, doing nothing while it appears to proceed and be sustained by the powers of the system, cautiously aiding these powers if they are insufficient, and ready to interpose if it becomes excessive. In this manner by judiciously refraining from injurious interference, or by delicately directing nature in her operations, the skilful practitioner conducts his patient to a favorable termination of the disease; while the meddlesome charlatan hurries on his to a catastrophe, under the delusion that severe diseases require at all times heroic remedies.

Not unfrequently when judiciously managed, the reaction continues to augment to the balance of health and then to cease; leaving the patient feeble but with no adverse symptom, in the manner heretofore described. In this case, he should remain a few days in bed, very *slowly* and *gradually*

returning to his usual diet. For three or four days he should take in moderate quantities, light animal broths. He should carefully avoid any exposure, or any fatigue of mind or body. The *great liability to a relapse* renders these precautions very necessary. Even slight irregularity or excess in diet endangers a relapse.

In some cases, as I have before mentioned, the powers of the system are so prostrated or oppressed, that reaction is imperfectly developed; the surface is not completely warmed, especially the feet; the vomitings, though much abated in frequency and severity, occur from time to time, and generally consist of a bright green, or of bilious matter; the cramps have not entirely disappeared; there is more or less mental torpor; the system seems struggling under a load too great for its energies. This state of imperfect reaction is, in short, a continuation, in many of its symptoms, of the preceding cold stage, and it requires the same treatment, modified according to the urgency of the existing symptoms.

In this state, particularly where there is much præcordial oppression, ipecacuanha is highly serviceable; it produces a general salutary shock and excitation, frees the large vessels of the blood dammed up in them, and increases capillary and cutaneous action. After its operation the vomiting is diminished or entirely ceases. To sustain the good effects of the ipecacuanha, and to allay the vomiting where it still persists, we should employ something similar to the mixture ture No. II. page 46. When a more stimulating one is thought necessary, we may substitute in its place No. I. of the same page. For tenderness of the epigastrium, which is a pretty frequent symptom in this state, we may apply leeches or blisters. This tenderness of the epigastrium should not prevent us from employing the mild stimulating treatment demanded by the condition of the patient in other respects. As excitants, or as derivatives, when there is much

mental torpor, or tenderness of the epigastrium, blisters are very serviceable. They should be applied to the insides of the legs, and when intended for excitants, removed before vesication has taken place. After what I have said on the treatment of particular symptoms in the preceding stage, I do not conceive it necessary to dwell on this point at the present time. As the patient approaches convalescence, or the development of a more perfect reaction, he should be treated in the careful manner before described.

When the reaction is full and complete, we have often only to moderate its force by diluent drinks, and leave the patients, for the most part, to the efforts of nature. In other cases, grave local affections, or general states of the system, are to be obviated. The danger most to be feared is the supervention of a cerebral affection, one, two, three, or four days after the development of free though moderate reaction, manifested at first by drowsiness, redness of the face, and injection of the conjunctiva. The pulse is generally pretty full, though neither hard nor frequent. It is often accompanied by several severe typhoid symptoms. What constituted the most difficult feature in the treatment of this cerebral affection, was its obstinate recurrence, after having been *several* times obviated. Patients could not sustain the repeated loss of blood necessary when venesection was relied on to remove it. Consequently it was usually fatal in the early period of the epidemic. We afterwards used a remedy, the results of which have been more flattering than any other I have known employed against any symptom whatever of cholera. This was a bladder of ice applied to the head. It was refreshing to the patient, admitted of frequent reapplication without exhausting his strength, and was effectual to the removing of the affection. The frequent and obstinate return of this affection, in whatever way it might have been combated, rendered the ice an

invaluable remedy. Six or eight leeches were generally applied behind each ear, and appeared to be valuable coadjutors. We have frequently practised general bleeding against affections of the head and stomach, in this state, with apparent temporary advantage, certainly without marked injury; nevertheless, my observation has not led me to be very prodigal of blood in cholera. In some few cases, there is a *frank* and decided inflammatory state of the system, with a full, strong pulse, rendering venesection necessary. Derivative blisters to the calves of the legs seemed also beneficial. They were accompanied with few inconveniences, for I saw no tendency to gangrene in any stage of the disease. But it was the ice to which the patient attributed his relief. Under its influence the stupor declined, and, at the same time, the dryness of the mouth, the heat of the surface, and the sordes on the teeth and lips, when it existed, disappeared also. The ice, contained in a bladder, was applied to the fore and upper part of the head. When its use for a longer period than two hours of the twenty-four was judged necessary, an interval of two hours was permitted to elapse between the successive applications.

The tenderness of the epigastrium, which was of frequent occurrence, easily yielded to the application of a few leeches, and the quiet and abstinence which the patient observed. In some few cases, however, venesection was judged necessary.

Towards the favorable termination of this stage, there occasionally appeared a slight cough, rarely so severe as to require more than the usual mild regimen, with some diluent and mucilaginous drinks.

As a beverage in this stage we may give gum water, lemonade or carbonated water—or something that shall fulfil at the same time some indication that may exist. If the heat of the patient is great, the lemonade, &c. may be ice cold. A return of the purging which was not unfrequent, I some-

times suspected to be occasioned by considerable quantities of cold lemonade taken into the stomach; but of this I am not sure. The purging when it recurs, should be immediately arrested by laudanum injections; for it does not relieve the local congestions or inflammations if any happen to exist, but endangers a return of the state of collapse.

The suppression of urine, which often continues for some days after the full development of reaction, not giving the patient any uneasiness, nor being in any way an urgent symptom; and its return though of very favorable augury, rarely producing any marked crisis, was seldom attempted to be obviated by any means specially directed to this object. In one case, where the urine had been suppressed many days, it speedily reappeared on the use of nitric ether. In several other cases I have thought that this remedy hastened its reappearance.

Typhoid symptoms, such as sordes of the lips and teeth; dry, red tongue, covered with a harsh dark fur, &c. with some confusion and slight wandering of the ideas which not unfrequently accompanied cerebral affections, yielded in general to the means put in use against the latter, and to the treatment adapted to the general state of the system. Camphorated emulsions and beverages containing nitric ether frequently formed a part of this treatment.

Camphor administered in emulsion and by injection, powerfully aided in the prompt removal of a severe nervous delirium. At the same time, ice to the head and leeches to the mastoid processes were employed.

Calomel and opium combined, I have not known employed, though I think they might be a valuable addition to our therapeutic resources in this stage. There exists in France a prejudice against the use of calomel, which deprives its citizens, in some diseases, of one of the most efficient agents of the materia medica. Preparations of mercury were tried in the cold stage, for a short time; but its

inefficacy, owing perhaps to the rapidity of the disease, and the fact that persons mercurialized for certain disorders were not exampted from attacks of cholera, soon led to its abandonment.

CONVALESCENCE.

After what I have said incidentally in the course of my observations on the importance, of returning slowly and gradually to the use of solid food, after an attack of cholera; of avoiding exposure and fatigue; of the liability to relapse, &c. I will despatch the subject of convalescence in a very few words. Sometimes the reestablishment in health is prompt and complete; at others, very protracted and interrupted with chronic inflammations and local congestions, keeping the patient in a state of debility, and sometimes terminating fatally. There are at the present time in the hospitals patients who have been free from choleric symptoms for two or three months. These protracted convalescences should be guarded against, by husbanding as much as possible the resources of the patient during the previous treatment. I do not know that the consecutive affections of cholera, to which I have just adverted, require, as such, any peculiar management, I shall therefore dismiss this subject.

The principles which should guide us in the treatment of cholera, being entirely applicable to cholerine, with only such modifications as may be demanded by the mildness or absence of particular symptoms, I conceive it unnecessary to make any repetition under the head of treatment of the latter affection.

I might easily have been more minute on the subject of treatment, but my object has been to lay down some principles, not to make a flourish of learned formulæ.

Predisposing Causes of Cholera. I have little to add under this head to the remarks I have already made, chiefly in describing the precursory stage. The predisposing causes are whatever diminishes the tone of the system, as fear, excessive fatigue, sexual indulgence, &c.—especially digestive derangements, *drunkenness*, and *excess* in eating. Exposure to the night air, after a drunken debauch, is very sure to produce an attack of cholera during its epidemic prevalence. A great increase in the number of cases was quite noticeable after Sundays and *other holidays.* The best course to be pursued during the prevalence of cholera, is doubtless to use a plain, good, substantial diet, drinking water or wine, and in other respects conforming to the *previous habits* of living, unless they have been irregular or too free. To avoid any *excess* in eating is of far more importance than the choice of this or that sort of food. Any great changes, as from a diet chiefly vegetable to one consisting mostly of meat, and vice versa, is not advisable.

Persons of all ages are attacked, from two months and upwards. There was one recovery at Necker Hospital of a woman aged eighty-four years. Children under the age of puberty, are most exempt. Persons who have arrived at, or passed the middle period of life, I think are most liable to an attack. Persons laboring under pulmonary affections appear to be less liable than others, though I have found softened tubercles in some cholerics. The insane and the mercurialized do not enjoy any peculiar exemption from cholera.

Diagnosis. On this point I think it sufficient to refer to the symptoms and appearances which I have described as characteristic of the cold stage. These are so marked that

I think it almost impossible to commit a mistake on this subject.

Prognosis. When the characteristic symptoms of the cold stage are all present in a considerable degree, the prognosis is very unfavorable. Of the intensity of the disease, perhaps the refrigeration, as a single symptom, is the best index. Recoveries are very rare of cases in which the respiration is perfectly cold. Copious perspirations in the cold stage are fatal. Ecchymoses forming under the conjunctiva betoken great danger, but are not always a fatal sign. The very few cases in which I saw delirium in the cold stage were all fatal. Complete stupor and total deafness are always fatal. Of the evacuations, the brick-colored, and after them those of a fish odor, were of the most unfavorable omen, and very generally fatal; the green stools denoted great danger, but less than those of either of the previous characters. Bile appearing in the matters purged or vomited was a favorable sign. The return of warmth to the surface, without a *copious* clammy perspiration, the diminution of its discoloration, and of the decomposition of the features, justify an increase of the hope for a favorable issue. When the resources of art are at hand at the moment of explosion, we may generally anticipate a termination in health. Advanced age, or dilapidated constitution, renders the prognosis very unfavorable. Between the age of puberty and twenty years, the prognosis is generally favorable. I am unable to decide whether it is more favorable in proportion as the patient is younger, for children were not received at Necker Hospital. Certain it is, however, that youth and a good constitution were *very favorable* to a fortunate prognosis. The return of the urinary secretion (which occurs only after reaction is established) is of very favorable omen: also a breathing perspiration, with a return of the healthful secretions of the mouth. Swelling of the glands is very rare, so much so,

that I am unable to form any prognosis therefrom. I have seen epistaxis in only three; it was slight; they all recovered. Pregnancy was unfavorable. Four pregnant women were received at Necker Hospital. They all aborted, three died, one recovered. Of five who gave suck, three recovered and two died. But it is useless to dwell on this subject, as our prognosis must be formed from the *ensemble* of symptoms, and not from single ones separately viewed.

Contagion. The cholera is not contagious. I had intended to consider this question, or fact,—for I conceive it now put beyond controversy—at great length, but it would occupy more space than I am willing to allot to the whole of my pamphlet. My opportunities for observation have been great, and I have had the contagiousness of the disease at all times in view. I have collected a mass of facts, many of which fell under my own observation, others were communicated to me by my friends: not one of them goes to establish the contagiousness of cholera.

As this subject requires for its full elucidation minute and tedious details of facts and circumstances, and as the few for which I have room at present would, from their small number, be insufficient to decide so important a point, I reserve the whole, to be presented in a digested form, if it should hereafter appear to me worth while. I will, however, mention a very few facts of a general nature, bearing on this subject. Immediately on rising from my bed, to which I had been confined a few days by some severe choleric symptoms, occasioned by a change of diet, I resumed my duties in the hospital. For weeks in succession I spent a considerable part of the twenty-four hours in the choleric wards, examining the patients, performing very frequently the offices of a common attendant, inhaling the breath of the sick and dying. I passed some hours every day in the dead room, making *post mortem* examinations, breathing the exhalations from the dead bodies.

I wounded myself, by running spicula of bones into two of my fingers; and notwithstanding the great liability to relapse, I enjoyed good health. The Sisters of Charity at Necker Hospital, who remained for months in succession, nearly all the time, not devoted to sleep, in attendance on the cholera patients, I believe all escaped any severe choleric symptoms. The hospital is situated in one of the streets ravaged with the greatest fury. Almost all the medical men of Paris agree in the opinion that cholera is not contagious: this unanimity is of more weight, when we consider that this is almost the only question pertaining to cholera on which they accord. The surgeons and physicians of Hotel Dieu, of St. Louis, of la Pitié, and some other hospitals, have declared this opinion in the public journals. The disease appeared in Paris, first in a part of the city least in communication with strangers, and *before the disease existed in any other part of the kingdom.* The French physicians sent to Poland are of opinion that it is not contagious. At Greville-street hospital, in London, which is exclusively appropriated to choleriques, and situated near the middle of the city, I was told that not an individual employed in the hospital, or in any way connected with it, had been attacked.

In the absence of known causes, I have adopted the belief that cholera is produced by some general, constitutional state of the atmosphere in those districts where it prevails. It is true that eudiometrical experiments throw no light on this point; but this fact militates as strongly against the existence of miasmata in general. No eudiometrical changes are discoverable in the air of wards crowded with choleriques.

Nothing can be expected from quarantine regulations, for as if in mockery of them, the cholera leaps over the sanatory cordons enforced by an European police.

It would be curious to trace several striking analogies, with some dissimilarities, between the spasmodic cholera

of the old world, and the spotted fever of our eastern states, or the "cold plague in the bowels" of our southern states. Some cases of adynamic fever, which Drs. Latham and Burrows were kind enough to show me in their wards at St. Bartholomew's Hospital, presented the same symptoms as I have seen in some cases of spotted fever in the eastern states of our own country. So complete is the resemblance, that I feel confident that the disease I saw in London is identical with that which has prevailed epidemically on the Connecticut river at different times, as I am informed, since 1805 or 7. These gentlemen told me, that fevers of this type have been of common occurrence at London for several months, *i. e.* coexisting with epidemic cholera. These facts I think interesting, as they show a somewhat similar epidemic constitution of the air in some parts of our country, and in some of those countries where cholera now prevails.

I saw a cholerique whose body was covered with small well defined petechiæ, extending to his thighs, while these, as well as his arms and legs, presented large patches of diffuse lividity.

STATISTICS OF CHOLERA.

All that the most practised skill and enlightened theory could suggest; all that charlatanism could conjecture, we have seen in Paris employed against the cholera, on a scale as regards numbers, of frightful extent, with results humbling the pretensions of the healing art. Doubtless the mortality was increased by this latitude of experiment, which was in part justified by the ill success of the most rational treatment. It was moreover much aggravated at Paris by the necessities of the times and circumstances. Cholera is too rapid in its progress: the different stages, requiring a variation in the treatment, succeeded each other too quickly

for the daily visits of hospital practice. It is to be observed also, that the mortality was doubtless much greater in the hospitals than in private practice. Though the medical men and citizens exhibited a courage and devotion worthy of all praise, the patients suffered much from neglect and confusion. Each patient requires for a time at least one attendant; and this was impossible without so encumbering the wards as to prevent any thing being done. Patients too were brought into the wards sometimes faster than they could be registered. I mention these facts to suggest the propriety of anticipating the like inconveniences, should the disease appear among us.

As an offset to the facts just presented, I should add, that when taken in its forming stage, or even at the moment of explosion, few diseases are more curable. Delay is death.

That the cholera should be unusually fatal at Paris, other circumstances being equal, was confidently to have been expected, from the great irritability of the gastro-intestinal mucous membranes of its citizens. This is shown by several facts, among which is one I am convinced of by ample observation, viz. that they do not bear the operation of severe cathartics with the same impunity as the Americans.

I regret that it is impossible for me or any other person to furnish accurate statistics of the mortality of cholera, compared with the numbers attacked. The official bulletins of cholera will never, I fear, destroy the proverb of "false as a bulletin." From what fell under my observation at London and from what I was informed by medical gentlemen there, I am persuaded that there is even more uncertainty in the English than in the French accounts.

The chief source of uncertainty in the statistics of cholera is, that in order to swell the proportion of cures, mild cholerines are sometimes included, under the name of

cholera. There are other examples of a direct and extraordinary want of good faith.*

In the following statistical account of the choleriques treated in all the hospitals of Paris, it is important to bear in mind, that there are included all persons who entered the hospitals for any choleric symptoms whatever.

From the 26th of March to the 30th of April, a period of thirty-six days, there were admitted into the different hospitals of Paris, 10,275 choleriques. Of these, 3065 were cured, 5285 dead, and 1925 under treatment the 30th of April. Little flattering to the efforts of our art, as this statement is, how very much less so would it be, could we subtract from the cures the mild cases of the epidemic influence !

If again, we subtract from the number those who die of a relapse, and relapses are very numerous, and those who die of consecutive diseases, where shall we be ?

The following is the statement for Necker Hospital, from the invasion of the epidemic to the 7th of July. Admitted, 479 ; of these, discharged cured 170 ; dead 283 ; under treatment, 26. During the rise of the epidemic, that is from the invasion to the 10th of April, there were admitted into Necker Hospital 200 choleriques; of whom 156 died, and 44 were cured.

Of the first hundred of choleriques admitted into Hotel

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* There is one example so noticeable, that I think the cause of truth and humanity requires it to be particularly mentioned, invidious as this duty is. Nothing but the celebrity of the author, in some respects well merited, and likely to produce an ill founded reliance on the treatment commended by him, could induce me to perform so disagreeable a task. M. Broussais, to sustain his well known doctrines, asserts that he cured during the first period five out of six choleriques, and subsequently thirty-nine out of forty. It has since been shown by the official documents of his hospital, signed by his own hand, that he has been on the whole much less successful than many other practitioners.

Dieu, it was not pretended that more than four were cured, and it has been shown that three of these four never had the cholera: one cure in 97 cases. From the invasion of the epidemic up to the 10th of April, there were admitted into the same hospital as choleriques, 1365 persons. Of these, 135 were discharged as cured; 751 were dead; and 479 under treatment on the 10th of April.

From the invasion to the 30th of April, there were treated at the Hotel des Invalides, 167 choleriques. Of these, there were on the 30th of April, 12 cured; 135 dead; and 20 under treatment. This is a mortality unexampled in the other hospitals, and is explicable chiefly if not entirely by the fact, that the patients were all dilapidated soldiers.

The cause of the greater mortality during the first period of the epidemic than subsequently, is to be sought partly in the fact that the disease then raged in its greatest severity, and partly in the fact that cholerines were comparatively rare till a day or two before the epidemic had arrived at its stadium.

It is also highly important to add that during the first days of the epidemic, there was a great backwardness in removing patients to the hospitals; so that many when admitted were in a hopeless state, and not a few moribund. And in those cases, where all possible dispatch is used to transport the patient to the hospital the moment he is attacked, so much of that time is unavoidably lost, in which our art offers *great resources*, and that state approaches from which very few recover; that I believe the patient will, in general, do better to remain at home and risk what attendance he can get there. In Paris, however, there are thousands who have no home in sickness but the hospitals.

While thus describing in unmitigated truth the fatality of the cholera at Paris, I have pointed out some causes by which that fatality has been greatly aggravated, and which under other circumstances may be avoided.

CASES.

Case.—*Cholera.*—Me. Tabouret, aged 42 years, of middle stature, and generally enjoying good health, has had a diarrhœa for three weeks. Notwithstanding this she considered herself as well, and was employed yesterday, April 12th, in her trade of sempstress. She supped last night, and went to bed as usual. She awoke this morning, 13th of April, about 5 o'clock, with an urgent inclination to have a passage. She was seized with colics while on the pot; at the same moment she perceived the great change of her voice. A short time after there supervened nausea and retchings, with cramps in the feet and calves of the legs. On arriving at the hospital at half-past eight o'clock, she presented the following state: frequent watery discharges from the bowels; occasional nausea and vomitings; severe cramps; pulse imperceptible; suppression of urine since last night; voice feeble, and much changed; face somewhat cadaverous; cold about the mouth, and especially the end of the nose; lips of a violet color; tongue moist, furred with white; hands and feet wrinkled, and of a livid marbled appearance; no head-ache; intellectual faculties sound; pain at the epigastrium, in the right hypochondriac, and in the lumbar regions; abdomen sunk, and of a doughy feel; thirst urgent; she prefers warm drinks to cold; respiration slow, and performed by the costal muscles; she had a slight chill immediately after her arrival in the hospital. Leeches were applied to the epigastrium, and we succeeded in drawing six or eight ounces of blood from a vein of the arm. The blood was black, and flowed with difficulty; sinapisms were applied to her feet; she took a spoonful of the mixture No. I. page 46, from time to time; as a beverage she drank a warm infusion of camomile and linden-tree flowers.

At twelve o'clock the pulse was perceptible, but extremely feeble; the surface was more warm, and reaction seemed about taking place.

At half-past one she suffered atrocious pain in the loins; pulse was almost imperceptible. A sinapism was applied to the lumbar region, and the pain abated.

At six o'clock she was lying on her back, regardless of every thing; her forehead contracted into a frown; her eyes a little injected; respiration a little stertorous; she was soon moribund, and died at 7 p. m. The blood drawn in the morning resembled a dark jelly, and was without any serum.

Examination of the body fourteen hours after death. The body was warm and rigid, and the surface presented the usual discoloration. Arach-

noid membrane injected; substance of the brain firm, and a little injected; the section of it, when cut, was very smooth; the ventricles contained about an ounce of serum; lungs sound, except some ancient adhesions; heart, and first portion of the large blood-vessels, filled with black liquid blood; peritoneum sound and dry; stomach externally rose-colored in patches, contained a large quantity of a greenish liquid; its mucous membrane was colored in the same manner as the external surface; this was chiefly owing to the injection of the subjacent cellular tissue; the mucous membrane was of the usual thickness and firmness. The external tunic, as well as the mucous membrane of the small intestines, was of a deep rose-color, approaching to that of Spanish brown; this was chiefly owing to the injection of the subjacent cellular coat, and in a less degree, of the mucous membrane itself; the latter was covered with a thick creamy mucus; the intestine contained a large quantity of a turbid liquid of a deep brick red color; the discoloration of the intestine became less as we descended; at the commencement of the large intestine it was white; the sigmoid flexure was of unusual whiteness. As we descended, the fluid found in the intestines became lighter colored, and of greater consistence; in the lower part of the small intestines it was grayish; in the sigmoid flexure it resembled a white thick unboiled starch; the spleen and kidneys were natural; the liver contained a small quantity of dark blood in its large vessels; the gall bladder contained the usual quantity of a dark colored bile.

Case.—*Cholera.*—A robust woman, aged about 50 years, was brought into the ward St. Louis, of Necker hospital, the evening of April 17. She was in a state of profound stupor, from which she could not be roused; on being placed in bed, on her back, she remained motionless in that posture; she was perfectly deaf and speechless; face cadaverous; pupils dilated; hands and feet cold and livid; pulse very slow, large, and easily compressible; respiration very slow and quiet; she manifested no uneasiness on pressure of the abdomen; neither cramps, vomiting, nor purging. We could obtain no information respecting her, except that when first discovered she was in the same condition. Bottles of warm water were applied externally, and the ordinary potion given. The next morning her condition was absolutely the same. She was bled at nine o'clock, and died two hours after, that is, about fifteen hours after entering the hospital, without having uttered a single word, or hardly made a single motion.

Case.—*Cholera.*—April 19, 1832. Me. Coubard, aged 55 years, lean, of middle stature, and tolerable constitution; was brought into the ward St. Louis, of Necker hospital, at eleven o'clock this morning. She has had a diarrhœa for about fifteen days. Last night, about ten o'clock, this was suddenly augmented, and accompanied by retching and vomiting. Upon the vomiting and purging, which were renewed from time to time, there supervened about eight o'clock this morning, cramps of the soles of the feet, and subsequently, of the calves of the legs. On entering the hospital she presented the following state: considerable prostration; pulse

feeble, 90 a minute; surface of the body cool, rather than cold; the hands and feet cold and stiff; the skin wrinkled and somewhat marbled; slight choleric decomposition of the features; tongue covered with a little white fur; slight deafness and tinnitus of the left ear; cephalalgia confined to the left side of the head; voice weak, and of the choleric shrillness; epigastrium slightly sensible on pressure.—She was put in bed, and bottles of warm water placed at her feet and sides; frictions of the limbs were succeeded by sinapisms; a spoonful of the compound mixture of laudanum, mint-water and ether, was administered from time to time, *pro re nata*, as were also opiate injections. She vomited several times during the day; during the night she drank very little, and the vomiting ceased; though she had occasional retchings. The cramps ceased in the course of the day. The purging was gradually diminishing, though it still existed the next morning at seven o'clock.

April 20, seven o'clock a. m.—She has become gradually warm; she, however, complains of cold feet, and demands a frequent renewal of the warm applications. Her hands are warm, and nearly of their natural appearance. The purging is considerably moderated; in place of vomiting, she has only occasional nausea and retching; the cramps have ceased. She has not urinated since an early hour yesterday morning. She complains of general weakness and prostration, that her head is weak, but not the seat of pain. Pulse small, feeble, and rather frequent; the natural intonation of her voice is much changed, and shrill; tongue is covered in its centre with a yellowish fur; epigastrium a little sensible on pressure.—As a beverage from time to time, a decoction of salep with gum-water—the mixture consisting of orange leaf water, syrup of gum arabic; carbonate of soda, and lemon juice; injection, containing ten drops of laudanum.

April 21, eight o'clock, a. m.—Purging, vomiting, nausea, cramps have entirely disappeared. She has slept two or three hours the last night. Pulse excited, frequent and a little tense. Thirst considerable; and she drinks freely without its producing nausea. The surface generally is warm, though she still asks for warm applications to her feet. She is a little drowsy; face flushed, warm, and has lost the choleric appearance; left eye a little injected; slight pulverulence of the nasal fossæ; a pain mounts from the left shoulder and occupies the left half of the head, producing tinnitus of the ear of that side. She discharges a good deal of flatus by the mouth. Epigastrium no longer sensible. Suspension of urine continues without causing her any inconvenience. She complains of general debility. Decoction of salep with syrup of gum. A potion containing twenty drops of nitric ether. Abstinence. About noon she discharged about half a tumbler of urine.

April 22. The slight drowsiness of yesterday and the other signs of determination to the head are nearly dissipated. She slept about three hours last night. She continues to urinate pretty freely. The tinnitus and deafness of the left ear persist, with a sensation as if a current of air were blowing through it. The right half of the head is free from pain. There is a sensation of heat in the loins. Thirst considerable; tongue

moist; pulse frequent; no vomiting, purging, or cramps.—Same prescription as yesterday.

April 23. Eight a. m. Considerable discharge from an abscess which formed in the left ear. She slept well; urinates well; has had no passage; epigastrium indolent on pressure. The surface has its natural feel; pulse is good, soft; countenance is good; general debility considerable.—Edulcorated decoction of salep. Rice soup.

April 24. Convalescence continues. Discharge from the ear is abundant; feet preserve their warmth without external applications. Pulse feeble, in other respects good. General debility. Very little appetite.—Same prescription as yesterday, with a small portion of solid food.

April 25. Diarrhœa returned yesterday, and after three stools was checked by an opiate injection. Copious discharge from the ear at the same time. She perspired freely in the night; had occasional refreshing slumbers; and this morning complains of no pain.—Food, &c. the same as yesterday.

April 27. Diarrhœa has returned since yesterday five o'clock p. m. Each passage is preceded by a dull colic, but it is discharged almost without sensation. Abdomen indolent on pressure. She was suddenly seized with the diarrhœa without any precursory symptom. The discharge from the ear is not diminished since the return of the diarrhœa. She expectorates a considerable quantity of clear glairy saliva. Her tongue is a little charged in the centre.—Decoction of salep with the syrup of gum. Opiate injections *pro re nata*. Abstinence.

From some cause only one injection was given, notwithstanding which the diarrhœa continued about once an hour till midnight, when it ceased without the use of any remedy.

April 28. No passage since midnight. Abdomen sunk but soft, and not at all painful. No sleep last night. The discharge, deafness and slight tinnitus of the left ear continue, except which she complains only of general debility.—Injection of six drops of laudanum: two soups, decoction of salep, with the syrup of gum.

April 29. To-day she has had one passage.—Prescription same as yesterday.

April 30. Diarrhœa ceased entirely; discharge from ear diminishing; she complains only of feebleness.—Decoction of salep with syrup of gum. Two soups.

May 1. No alvine discharge since day before yesterday.—Same prescription as yesterday, with the addition of a little solid food.

May 3. Convalescence has resumed its march. The patient suffers only from general debility.

May 10. Convalescence continues without any very adverse symptom, but proceeds very slowly. The patient complains chiefly of general debility. Some time afterward the patient left the hospital to try the effects of change of air and scenes in restoring her strength.

I have given this case as an example of protracted convalescence, which we not unfrequently see following an attack of cholera. This state sometimes continues for several months.

Case.—*Cholera.*—A woman named Bezar, aged 50 years, of moderate embonpoint, and pretty good constitution, married, and mother of several children, was brought into the ward St. Louis, about 4 p. m. to-day, April 17. She slept well last night, and was engaged in her usual business, that of sweeping the streets, this morning, till half-past nine o'clock. Returning home, she felt an uneasy sensation at the stomach, and drank some coffee. Immediately on taking the coffee she was seized with a diarrhœa, at first of common fecal matter, but it soon became very liquid, and is described by the patient as water. About two o'clock she drank a little wine, which was immediately vomited. She was seized with cramps at the moment of entering the hospital, first in the soles of the feet, and successively in the calves of the legs and thighs. Condition at five p. m. of the same day: features cadaverous and cold; eyes sunk, and surrounded with a livid circle; eyelids half closed when she reposes; nose and prolabia livid and cold; tongue moist, cold, and a little charged with a whitish fur; feet and hands cold, and livid; she lies on her back, and says she is very weak; no head-ache; somewhat deaf; thirst not very urgent; voice very feeble, and much altered; abdomen and epigastrium somewhat sensible; no colic; respiration slow; radial pulsation extremely feeble, almost extinct; urinary secretion suspended; intellectual faculties well preserved; she complains of cold, and prefers warm beverages; great prostration; the purging is almost continual, of a whitish watery liquid, which has penetrated a thick bed, and is running in a stream on the floor; cramps and vomiting are renewed at short intervals. Sinapisms were applied to her lower extremities; she was enveloped in an atmosphere of warm vapor conveyed under the bedclothes.—A tablespoonful of the mixture, No. I, was administered every hour, and she drank of an infusion of camomile. An hour and-a-half after she was covered with an abundant cold viscid perspiration.

April 18. a. m.—Pulse imperceptible; voice nearly extinct; eyes injected; ecchymosis under the conjunctiva of the left eye; face cold; prolabia livid; tongue cold, very moist and soft; pulverulence of the nasal fossæ; extremities cold, livid, and wrinkled; abdomen sensible on considerable pressure; only slight cramp since yesterday evening; vomiting has ceased; diarrhœa continues.—Continue the mixture, to which add xx drops of aq. ammoniæ; opiate injection; sinapism moistened with aq. ammon. along the spine.

At eleven o'clock ecchymoses had formed in both eyes; she sunk into a stupor, and died quietly the same evening, twenty-four hours after entering the hospital, and thirty after the attack.

Autopsy sixteen hours after death. Body and limbs very rigid and somewhat discolored. Brain not examined. Lungs natural. Heart and aorta gorged with black uncoagulated blood. Stomach contained a considerable quantity of a whey colored troubled fluid; its color externally was of a rosy hue in patches, in other parts natural; internally the color was the same as externally, depending in part on some injection of the mucous membrane, but chiefly on that of the subjacent cellular tissue. The small intestines externally were red; on raising their peritoneal covering this

coat was found dry and sound. The small intestines contained a whitish creamy liquid in their upper portion, this changed into a dirty brown, and reddish or brick colored fluid as we descended. Their internal surface was of a deep brick color, and owing to the same causes as that of the stomach. The mucous membrane was neither thickened nor softened. The large intestine was contracted; the mucous membrane of the ascending colon was of unusual whiteness; the transverse colon was red and injected similarly to the stomach. Bladder empty and contracted. Liver sound, free from blood. Gall bladder contained the usual quantity of bile, of a color darker than it is commonly found. Other abdominal viscera sound.

I have related the foregoing as a specimen of the progress of the disease in a great proportion of severe cases, and of the appearances they offered on examination after death.

Case.—*Cholera.*—A German woman, aged about thirty years, of a robust constitution, married, bore a child the 29th of January last, which she now suckles. She was attacked with cholera the 9th of April about seven o'clock in the morning. Colics, vomiting and purging followed each other in quick succession. Cramps supervened in the evening. On being brought into the hospital the next day she presented the usual state, viz. persistence of the symptoms just mentioned with prostration, coldness of the extremities, suppression of urine, sensibility of the epigastrium, choleric features, great alteration of the voice, urgent thirst. Reaction however appears to be commencing under the use of frictions, external warmth, the mixture of laudanum, ether, &c. and of opiate injections.

April 11. Cessation of cramps, vomiting and purging; heat of the surface is returning, though reaction is not yet fully declared.—Lemonade. Ipecacuanha, thirty-six grains in two doses.

April 12. Reaction is moderate yet completely sustained, and without any adverse symptom. Her breasts which have been neglected heretofore, are now found to be distended with milk. A small puppy on being applied to the nipple sucks the milk with avidity.—Lemonade.

April 13. Her favorable state continues. The secretion of urine returned to-day.—Lemonade. Vermicelli soup.

April 14. Decidedly convalescent. The puppy continues to draw the milk from her breasts.—Lemonade and vermicelli soup.

April 15. Convalescence proceeds rapidly. Her pulse is good; skin natural; no thirst; voice has nearly recovered its usual sound; sensibility of the epigastrium has disappeared, though she has had no passage since the 12th. There remains only a want of strength.—Lemonade; soup and a small quantity of solid food.

April 19. Convalescence has proceeded very rapidly, the quantity of her food has been gradually augmented; her breasts drawn by the small dog; and she was discharged to-day cured.

In this case, the characteristic symptoms of cholera were all present, but not in a very aggravated form. The reaction was gradually developed; the choleric symptoms at the same time disappearing, and the suspended functions resuming their play, without the supervention of any new

adverse symptom, and the disease speedily terminated in convalescence. There was, properly speaking, no stage of reaction; for, that state which I have so styled in this case, was merely the gradual disappearance of the choleric symptoms, and renewal of the play of the functions as in health, without any intervening symptoms.

Case.—Julie Puin, a domestic, aged 27 years, unmarried, of low stature and robust constitution, has had a diarrhœa, some head-ache, with depression of her physical forces for the preceding four days. She was attacked with a very severe cholerine about eight o'clock this morning, April 14th. She was engaged in her usual labor yesterday, and slept well last night. The invasion of the disease was very sudden, and compared by the patient to a blow. There occurred simultaneously, or in quick succession, prostration, chills, nausea, succeeded by vomiting, very abundant watery stools, without colic or local pain. She has been to the water-closet five times this morning before being brought to the hospital. On arriving at the hospital, two hours after the invasion, the following is her state:—slight refrigeration of the lower extremities; pulse weak, small, sixty a minute; respiration a little embarrassed, and slow; prostration considerable; mind agitated and depressed; head-ache; no pain of the epigastrium; neither numbness nor cramps; face nearly natural, there is a slight choleric circle around the eye; tongue moist, warm, with a whitish fur; voice tolerably strong; no thirst; vomiting, purging, and cramps are renewed at intervals.

She is put in a warm bath; frictions with the hand are made on the lower extremities; the mixture composed of ether, laudanum, &c. is administered; also an opiate injection. Under this treatment the choleric symptoms soon disappeared.

April 15. Passed a comfortable night. No adverse symptom remains. Her pulse is good, her skin soft, she urinates freely, and has no thirst. Inf. camomile and orange flower water.

April 21. She slowly returned to the use of solid food, and left the hospital to-day, cured.

In this case, the disease yielded promptly to the remedies mentioned above. Had it been neglected, it would doubtless have exhibited in a few hours all the symptoms of aggravated cholera. As there was no suppression of the urinary secretion, no alteration of the voice, no considerable refrigeration nor discoloration of the surface, and the vomiting and cramps were not severe, I have called it a severe cholerine; it might be properly denominated the stage of invasion of cholera. The voice was scarcely affected: in other cases I have known, the voice suddenly becomes nearly extinct simultaneously with the earliest symptoms noticed. As an example of the other extreme, or a very mild cholerine, I subjoin the following:—

Case of *Cholerine*.—Miss ——— aged 13 years, arose in the morning in the full enjoyment of her usual health. An hour afterwards, when descending a flight of stairs, she was seized with a sudden sensation of great

weakness, and fell. Nausea, with slight retching, occurred at the same time. She was immediately put in bed—a mixture containing mint water and sulphuric ether was administered, and warmth applied externally. When I saw her an hour after, mild reaction was already taking place. She remained in bed, and observed a mild regimen for two days, and no adverse symptoms followed.

In this case the epidemic impress was quite manifest, though very slight; and it is merely as an example of a very mild cholerine that I introduce it.

Case.—April 13.—M. Lefevre, aged 25 years, of small stature, and a dry temperament, was suddenly seized about twelve o'clock last night, with a diarrhœa, at first liquid, but gradually becoming more clear and watery. At the same time there existed pretty severe colics, and shortly afterwards coldness and numbness, with very slight cramps of the feet and legs, coldness of the hands, nausea, and slight head-ache. Frictions of the lower extremities were briskly performed; a spoonful of the mixture containing sulphuric ether, malaga wine, &c. was given him from time to time, also a decoction of poppies by injection; for a beverage he drank an infusion of camomile.

At ten o'clock to-day the diarrhœa, nausea, and coldness had disappeared; the surface of his body generally, was warm and dry; his *pulse full, strong, and somewhat accelerated;* considerable thirst; urinates as usual; countenance and voice nearly natural; says that the mixture excites him; no tenderness on pressure of the abdomen; venesection xii ounces.—Withdraw the mixture.

April 14th, 10 a. m. He has slept a little the past night. Except colic, and a little numbness of his legs yesterday evening, and coldness of them this morning, which has since passed away, he has had no choleric symptoms since he was bled yesterday.—Gum water. Two soups.

April 15. Has passed a comfortable night; no choleric symptoms. He left the hospital some days after, cured.

In this case the disease was promptly arrested in the commencement, and subsequently put on a form frankly inflammatory, requiring bleeding. Cases like the present, attended with arterial excitement, are sometimes though rarely met with. It is also to be remarked, that there was at no time any tenderness of the abdomen, though the diarrhœa was suddenly arrested, and the patient in the completest possession of his sensibility.

Case.—*Cholera.*—Me. Coquet, aged twenty-six years, of middle stature and good constitution, has been married seven years, has had three children and one miscarriage, viz. of her second pregnancy, and is now four months gone in her fifth pregnancy.

April 10, 1832. She has endured great fatigue, and slept but little for several days past, in attending her sick daughter. Fatigue excepted, she was in good health yesterday. Yesterday evening she dined on salad and boiled meat. Last night she felt some general indisposition. This morning she took some fat broth without much appetite. Neither headache nor diarrhœa before the invasion. About ten o'clock this morning she was seized with vomiting and purging simultaneously, without colic or tenes-

mus. Two or three hours afterwards, extremely violent cramps supervened in the feet, calves of the legs, thighs, hands and arms successively. Her limbs are numb, and livid or marbled. She experiences a sensation of coldness, particularly of her extremities. Her features are shrunk, cold, and of a deep livid hue; eyes hollow, sunk in and surrounded with a livid ring; tongue cold, moist, livid and covered with a whitish fur; voice nearly extinct; conversation is fatiguing; pulse imperceptible; urine suppressed; thirst excessive; abdomen sunk and of a doughy feel; she lies on her back regardless of what passes about her, except to request persons not to disturb her.—Mixture No.1, a spoonful every four hours. Sinapisms. Warmth externally. Opiate injection.

April 11. Her state is in general nearly the same as yesterday; her thirst is extreme, and she swallows with equal avidity cold or warm drinks; prostration very great; purging is less urgent.—Same prescription as yesterday, with the addition of thirty-six grains of ipecacuanha, to be taken in two doses; and cold lemonade as a beverage.

April 12. Symptoms the same, except somewhat abated in violence. The ipecac. appears to have produced no effect. Except the ipecac, continue the same treatment.

April 13. Pulse perceptible; very weak; slight reaction is commencing; no cramps to-day; drowsiness; eyes somewhat injected; tongue white slight difficulty of respiration. Six leeches behind each ear. Sinapisms to her legs. General treatment same as before, viz. an occasional spoonful of mixture No. 1, page 46.

April 14. Drowsy; face flushed; eyes injected; flighty dreams during the night. Reaction is slowly taking place; surface warm; pulse feeble. Ipecac thirty-six grains at two doses. Blisters to the calves of the legs. Bladder of ice to the head. General treatment same as heretofore.

April 15. Aborted a dead child. The drowsiness which yielded for a time to the application of ice, has returned in some degree; her pulse is tolerably strong, and eighty-five a minute; reaction is freely declared; she has rendered a considerable quantity of urine this morning, for the first time since the invasion of the disease; vomited a viscid *yellow* matter; tongue red and dry; thirst though considerable is much less urgent; purging has nearly disappeared. Tisan of the flowers of the linden tree, with orange flower water.

April 16. Purging, vomiting and cramps have ceased; one alvine evacuation since yesterday morning; tongue moist, fresh; pulse good; surface of the natural temperature; abdomen not painful on pressure; urinates freely; much less drowsy than yesterday. Treatment same as yesterday, with the addition of an infusion of camomile.

April 17. Three or four passages since yesterday; some nausea without vomiting; pulse a little excited; slept without being harassed by flighty dreams. General state favorable. Syrup of gum arabic. Injection containing ten drops of laudanum.

April 18. A little drowsy; eyes slightly injected; slight epistaxis from efforts made in coughing; occasional retching; no sensibility of the abdo-

men; pulse a little excited; tongue rather red, moist, and a little swollen. Syrup of gum arabic.

April 19. Slept well last night; has discharged considerable quantities of bile upwards and downwards; pulse good; a little appetite; face less flushed; eyes not injected. Orange flower water in a tisan of the flowers of the linden tree.

April 21. Slight cough with occasional bleeding of a few drops from the nose, since day before yesterday. She suffers no pain whatever, and complains only of the cough and general debility. From this time she commenced taking nourishment.

April 24. About eight o'clock in the morning, and again about midday she had a violent fit of shivering. Each fit lasted about an hour. She felt no inconvenience after they were past. Syrup of gum arabic. Tisan of linden tree flowers. The eighth of a portion of food.

April 25. She had another chill without shivering about nine a.m., which was followed by fever and headache. Same prescription as yesterday. About seven o'clock this evening, after a momentary sensation of icy coldness pervading the whole body, she was seized with very violent shivering without pain, which ceased almost instantly after the application of ligatures to the right thigh and left arm, so tight as to arrest the circulation.

April 26. She slept but little last night; feels pretty well however to day. Syrup of gum arabic; soup; and a small portion of solid food From this time she improved in health very rapidly, and left the hospital May the 1st, perfectly cured. Before reaction was fully declared, she took from time to time, every four or six hours, a spoonful of the mixture No. 1. The external means for promoting warmth were also assiduously employed. The determination of blood to the head was subdued first by the leeches, and subsequently with great promptness by the application of ice. The lochial discharge which existed after the abortion, was doubtless a very important derivative. Of the four pregnant women attacked with cholera and received at Necker hospital, this is the only recovery.

Case.—*Cholera.*—May 3. Victorine Paulin, a beautiful orphan girl, aged fifteen and a half years, of moderate embonpoint, and good constitution, menstruous about a year, was seized with a simple diarrhœa on Sunday, April 29; this continued till last night, when on it there supervened vomiting and cramps. She was brought into the hospital this morning at seven o'clock, May 3d—it being about six hours after the invasion. At this time she presented the following symptoms, &c. Vomiting of a greenish matter, in moderate quantity, is repeated about every twenty minutes or half-hour; diarrhœa of a similar character; cramps in the calves of the legs very severe, and almost continual; cadaverous decomposition of the features; the eyes sunk, and surrounded with a livid circle; when she reposes for a moment, the eyelids are but half closed—nose pinched up, and cold; tongue cold; blueness of the prolabia; refrigeration of all the surface of the body, with lividity of the extremities; pulse im-

perceptible; respiration at times a little anhelating, but unfrequent; the air expired is of a peculiar sourish odor; voice weak, and on being exerted, raucous, or harsh; urinary secretion suspended; thirst excessive; complains of burning internal heat, and swallows ice with the greatest avidity; neither pain of the head, tinnitus aurium, nor sensibility of the epigastrium; alternate somnolence and cries, with violent agitation in the bed; intellectual faculties unharmed.

On entering the hospital, frictions were made over the whole surface with ice, for the space of ten minutes, and with great briskness. She was then wiped dry, and enveloped in warm woollen blankets, and bottles of warm water were applied to her feet. There was a momentary reaction, which was not sustained; the pulse was perceptible, and the refrigeration less; but she soon relapsed into the same cold and pulseless state as previously to the frictions. An hour afterwards the frictions were repeated in the same manner, and with the same temporary amelioration. In the mean time she took occasionally a little wine and water, ice-cold, as a beverage. The ice frictions were repeated five times in the course of the day; she also took in the same time, four spoonsful of the mixture of mint water, laudanum, &c. The radial pulsation and action of the surface were excited immediately after each of the frictions, but they soon partially subsided; on the whole, however, reaction was gradually taking place. There was less somnolence—the cramps, purging, and vomiting were less severe. At five p. m. the tongue was still a little cool, but by no means so cold as in the morning. The night was tolerably tranquil, with some vomiting and cramps, much abated however in severity. The diarrhœa was arrested completely by opiate injections.

May 4th, eight o'clock in the morning.—No vomiting, purging, nor cramps for several hours; the pulse is becoming fuller—the surface warm; in one word, reaction is taking place. To assure this, there was administered from time to time a tablespoonful of mixture No. II, page 46, to which was added a few drops of laudanum. Mustard poultices were applied to the lower extremities. For a beverage ice lemonade.

May 5. Reaction considerable—face a little flushed, eye a little injected, and the surface generally is quite warm; the vomiting, &c. have entirely ceased—pulse a little elevated. Applied twelve leeches behind the ears to diminish the mass of blood and prevent the cerebral congestion which is threatened. For a beverage wine and water.

May 6. Nearly in the same state, with a little amelioration. A broth was given to the patient at her own request. Weak wine and water. Ice applied to the head for four hours.

May 7. A determination of blood to the head which existed in the morning, was dissipated by the application of ice for four hours.—Beverage weak wine and water.

May 8. Considerable improvement, no adverse symptoms except the suspension of the urinary secretion.—Wine and water. Two vermicelli soups.

May 9. Convalescent.—Two vermicelli soups. Milk.

May 10. Improving rapidly. Urinary secretion completely restored to-day. Wine and water; two vermicelli soups, and a little solid food.

May 16. Convalescence has terminated in complete recovery, and the patient was discharged cured.

In this case the cold stage was very severe—that of reaction mild, and convalescence rapid. Youth and a good constitution were much in favor of the patient. The cerebral affection, at no time very severe, yielded promptly to the application of ice and leeches. The urinary secretion was suspended seven days without occasioning the patient any local uneasiness. Its complete restoration was preceded two or three days by a very scanty secretion. The most important fact in this case however, is the very favorable effect of the ice frictions, which refreshed the patient, and produced considerable temporary action. This temporary excitement did not altogether subside, but was gradually augmented into moderate sustained reaction. The vomiting, cramps, and purging ceased with the establishment of reaction on the 4th. The constipation persisted till the 10th, without any ill consequence, when she had a healthy discharge without the use of any remedy.

Case of *Cholerine*.—April 14, 1832. Marie Louise Balle, aged 17 years, of considerable embonpoint, unmarried, has menstruated but once within the last year; is subject to head-ache and nausea; has been for some time tormented with leucorrhœa till within the last fifteen days, since which time it has disappeared. She has been completely constipated for the preceding eight days. About seven o'clock this morning, while ascending a flight of stairs, she was seized with a sensation of great general weakness, and a few moments after with sickness of the stomach, and retchings to vomit. At that moment she perceived, for the first time, that her abdomen was painful. About half-an-hour after, she had very severe cramps in the calves of her legs, which continued, with only momentary interruption, till her arrival at the hospital about 10 o'clock in the morning. Simultaneously with the cramps, she had chills, with great coldness of the feet. To the shivering there succeeded about an hour after, considerable warmth, and vascular excitement. She took nothing but some warm coffee. Frictions were made, with some relief of the cramps.

She was brought into the hospital about 10 o'clock. Frictions, with a stimulating liniment, were made with great briskness, and repeated three times in the course of the day. These procured temporary alleviation, and at length complete cessation of the cramps. Cramps occurred the last time about 4 p. m. Except the frictions, nothing was done for her till 5 p. m. She then presented the following state:—surface warm; pulse full, seventy-six a minute; face flushed; head-ache for the past two hours; thirst considerable; tongue covered with a very little white fur; abdomen sensible on pressure; no passage for eight days. Venesection twelve ounces; emollient injection.

April 15. She was much relieved by the bleeding, and by the injection which procured free motions of the bowels. The tenderness of the abdo-

men is nearly dissipated. The other adverse symptoms have all disappeared.

April 16. She is quite recovered.

The case is interesting, as it exhibits a form of the disease of rather rare occurrence, viz. choleric symptoms, accompanied by a constipated state of the bowels. The sudden prostration, sickness of the stomach, and coldness, rendered the *debût* sufficiently characteristic. These soon disappeared however, and there remained only a single choleric symptom; viz. the cramps, which were very severe. They yielded to very brisk friction, without any other remedy whatever, either internal or external. They had entirely ceased before venesection was performed.

Case.—*Cholera.*—April 10. A young woman, named Henriette Pairier, aged 19 years, unmarried, of moderate embonpoint, and good constitution; after a diarrhœa of three or four days' continuance, was seized about two p. m. to-day with vomiting and cramps, a great increase of the previous diarrhœa simultaneously. She was brought to the hospital about eight p. m.; that is, about six hours after the invasion. Her face cadaverous; limbs cold and livid; her voice profoundly altered; urinary secretion suppressed; pulse imperceptible; thirst urgent; epigastrium not sensible. Purging, vomiting, and cramps at short intervals.—Sinapisms to limbs; frictions; warmth externally; opiate injection; mixture No. I. internally, page 46.

April 11. Re-action is gradually taking place; the symptoms of yesterday are somewhat abated in urgency.—Prescription same as yesterday, with the addition of inf. ipecac.; and for a beverage, lemonade.

April 12. Re-action is freely declared, but is not excessive; the purging, vomiting, and cramps have ceased.—Lemonade.

April 13. Favorable state continues.—Lemonade; gum linctus.

April 14. Disposition to sleep, with slight stupor; face flushed; eyes injected; pulse full, not hard nor frequent.—Lemonade, ice cold; twenty leeches behind the ears.

April 15. The symptoms of yesterday, which were abated after the application of the leeches, have re-appeared in the course of the night.—Iced lemonade; bladder of ice to the head two hours, and sinapisms to the lower extremities.

April 16. Amelioration during, and for a time after the application of the ice, with a subsequent return of the drowsiness, &c.—Same prescription.

April 17, 18, and 19. Same temporary amelioration following the application of the ice on the head each day. The mouth, however, is becoming dry, and fuliginous about the lips and teeth.—Same prescription each day.

April 20. Drowsiness, and other symptoms more considerable, with slight delirium; and sordes of the tongue, lips, and teeth.—Ice lemonade, ice to the head four hours.

April 21. Very considerable amelioration; mouth moist; sordes disappearing; intellect clear.—Blister to the inside of one leg; iced lemonade.

April 22. The patient is improving.—Lemonade.

April 23. Condition still favorable, except the recurrence of some diarrhœa this morning.—Injection with ten drops of laudanum; lemonade.

April 24. Convalescence appears to be commencing; the mouth is moist; injection of the eye and flushed face have disappeared.—Gum linctus.

April 25. Convalescent.—Gum linctus; broth half a pint.

April 27. Improving.—Two vermicelli soups. She gradually improved; slowly returning to solid food, and was dismissed cured the eighth of May.

In this case the vomiting, purging, and cramps yielded to the mixture, to opiate injections, and frictions. From the constipation that existed till convalescence was somewhat advanced, no ill effect was perceived. The return of the diarrhœa for a short time was not critical, for it occurred three days after a decided amelioration. The urinary secretion, however, returned about the same time. The ice in this case was of great service; it refreshed the patient, and eventually overcame the cerebral affection, and the symptoms therefrom depending, though they returned with great pertinacity and increased severity from the fourteenth to the twenty-first. It is very clear that the patient could not have sustained repeated loss of blood, necessary to subdue these symptoms. For it was found in other similar cases, that the affection of the brain, sordes of the mouth, &c. returned as well after being checked by bleeding as after the application of ice. Indeed, after venesection was pushed beyond a certain point, it aggravated instead of alleviating these affections. After the declaration of re-action to the period of convalescence, the pulse was generally full, soft, not frequent, but rather below the standard of health.

THE

CHOLERA SPASMODICA,

AS OBSERVED

IN PARIS IN 1832:

COMPRISING

ITS SYMPTOMS, PATHOLOGY, AND TREATMENT.

ILLUSTRATED BY CASES.

BY ASHBEL SMITH, M.D.
OF NORTH CAROLINA,
Officially attached to the Necker Hospital, during the prevalence of this Epidemic.

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